Strengthening Research-Industry Partnership Through Strategic R&D Management

Editorial Note
E.B. Aromin

Competing Papers

Determinants of Strengthened Research Capability and Fostered Research Culture in State Higher Education Institution in the Region
M.A. Falderve, Jr.

ICT-Based Research and Development Program to Strengthen Rice and Banana Industry Under LGU-Industry-Knowledge Center Partnership: Experiences of the Open Academy for Philippine Agriculture in Cagayan Valley
O.P. Balderama, et al.

C.M. Pascual, et al.

Research and Development Management Effectiveness in Agricultural Higher Education Institutions in Western Visayas
H.U. Navarro

Assessment of the Research Culture Among Private HEIs in a Region: Basis For Developing a Primer
J.D.P. Talens

Statistical Human Resource Development: The Case of Bukidnon State University, Philippines
J.M. Mirasol

Research Capability Building - A Strategy to Promote Research Culture in the SUCs and Countryside Development: The RSC Experience
M.C. Mani, et al.

Academe and Community Initiatives: An Approach in the Preservation and Management of Upland and Lowland Areas in the Province of Occidental Mindoro
A.N. Venturina and E.V. Macadaeg

Forging Partnership with the Indigenous People in the Poverty Alleviation Promotion thru Environment and Livelihood Program for the Buhids (Papel Buhid): The OMNC Experience
S.G. Lumbo, et al.

Exploring Opportunities for Farmer-Led Research and Development: The Cavite State University Experience
D.C. Chavez, et al.

Sustainable Agricultural Technologies and Practices Development Program: Poverty Reduction Tool
M.B. Marigmen and E.V. Macadaeg

Yam (Dioscorea Alata Linn.) Research – Industry Partnership Program

Trip Clinic: Mangyan Participation in Natural Resource Management
N.A. Orfiano and GC. Callang

The Mushroom Industry in Central Luzon: Towards Finetuning R&D and Extension for Industry Revitalization
A.E. Soriano

Cross Cutting Approaches in Reaching Out the Indigenous People of Occidental Mindoro Through Natural Resource Management and Community-Based Livelihood Options
S.G. Lumbo, et al.
This issue of PHILARM Journal is published by the Philippine Association of Research Managers, Inc.

PHILARM Journal
Volume 6 No. 1 • April 2009

EDITORIAL STAFF

Erlinda B. Aromin
Editor

Mary Charlotte O. Fresco
Gina A. De Asis
Associate Editors

Almira G. Magcawas
Managing Editor

Reynaldo C. Castro
Wilfreda A. Maslog
Consultants
Strengthening Research-Industry Partnership Through Strategic R&D Management

Editorial Note 1

Competing Papers 5

Determinants of Strengthened Research Capability and Fostered Research Culture in State Higher Education Institution in the Region 7

ICT-Based Research and Development Program to Strengthen Rice and Banana Industry Under LGU–Industry–Knowledge Center Partnership: Experiences of the Open Academy for Philippine Agriculture in Cagayan Valley 26


Research and Development Management Effectiveness in Agricultural Higher Education Institutions in Western Visayas 61

Assessment of the Research Culture Among Private HEIs in a Region: Basis For Developing a Primer 81

Statistical Human Resource Development: The Case of Bukidnon State University, Philippines 139

Research Capability Building - A Strategy to Promote Research Culture in the SUCs and Countryside Development: The RSC Experience 147

Academe and Community Initiatives: An Approach in the Preservation and Management of Upland and Lowland Areas in the Province of Occidental Mindoro 166

Forging Partnership with the Indigenous People in the Poverty Alleviation Promotion thru Environment and Livelihood Program for the Buhids (Papel Buhid): The OMNC Experience 177

Exploring Opportunities for Farmer-Led Research and Development: The Cavite State University Experience 187
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Agricultural Technologies and Practices Development Program: Poverty Reduction Tool</td>
<td>199</td>
</tr>
<tr>
<td>Yam (Dioscorea Alata Linn.) Research – Industry Partnership Program</td>
<td>213</td>
</tr>
<tr>
<td>Trip Clinic: Mangyan Participation in Natural Resource Management</td>
<td>233</td>
</tr>
<tr>
<td>The Mushroom Industry in Central Luzon:</td>
<td>238</td>
</tr>
<tr>
<td>Towards Finetuning R&amp;D and Extension for Industry Revitalization</td>
<td></td>
</tr>
<tr>
<td>Cross Cutting Approaches in Reaching Out the Indigenous People of Occidental Mindoro Through Natural Resource Management and Community-Based Livelihood Options</td>
<td>261</td>
</tr>
</tbody>
</table>
EDITORIAL NOTE
Strengthening Research-Industry Partnership Through Strategic R&D Management

Erlinda B. Aromin

In the Research and Development continuum, the inevitable and olympian partnership of the research entity and the industry is a necessary step towards achieving the overall development goal of any organization. The R&D manager therefore must be fully armed with management skills as he walks through the partnership road leading to an outcome that would mutually benefit all actors in the development process.

As the sole private social network that works for the benefits of those in the R&D and S&T system, the Philippine Association of Research Managers, Inc. (PHILARM) is in the forefront of giving technical and managerial support to managers of RDE organizations. Realizing the need to give light on the many intricacies of the research and industry link, this year’s Annual Convention is focused on “Strengthening Research-Industry Partnership Through Strategic R&D Management.”

Held on April 21-24, 2009 at the Mergrande Ocean Resort in Talomo, Davao City, the Convention paved the way for actively discussing such partnership through different lenses. There were technical papers that tackled the how the partnership is forged with the higher education institutions in selected regions, as well as with local government units and indigenous peoples. Other papers focused on the research culture and capability to strategize activities with the industry in some parts of the country. Meanwhile, a few papers dealt more on the specific technical areas of research such as those in the ICT and HRD, while some focused on various commodities.

Research managers who participated in this year’s Convention are in unison that while research-industry partnership has its own share of opportunities and threats, as well as, strengths and weaknesses, the R&D management system has the central role of orchestrating things to make the synergy work better for all development actors.

1 President, Philippine Association of Research Managers, Inc.
COMPETING PAPERS
Determinants of Strengthened Research Capability and Fostered Research Culture in State Higher Education Institution in the Region

Mario A. Fetalver, Jr.

ABSTRACT

The study sought to describe, analyze, and interpret the status of research culture in state higher education institutions in Region IV in relation to the dependent variable components such as research capability, research output, research dissemination, and research utilization as influenced by the independent variables such as the institutional research program, human resource, and material resource predictors.

Data on the independent and dependent variables were collected using the survey questionnaires and guided interview questions. Qualitative analysis was done to obtain the descriptive profile of the status of culture of research in the respondent school. Quantitative analysis was used to crosscheck qualitative analysis using the descriptive statistics such as weighted mean, standard deviation, frequency counts, percentage, ranks, and inferential statistics such as T-test, stepwise multiple regression analysis and correlation among other standard tools.

Two groups of respondents from five (5) respondent schools were involved in the study. The informants involved 289 respondents including 67 administrators completely enumerated, and 222 faculty members chosen by stratified proportional random sampling.

Findings on institutional research program factors show a high significant compliance on the standard; however, there is the need to strengthen the research networks and linkages, and

---

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Dean, IPSTED, Romblon State College, Olongan, Romblon
improve the research rewards, incentives, and recognition (RIR) for the efforts in research. Results of findings on human resource factors reveal that predominant respondents are males, married, and belong to age group of 35–41 years for the faculty and 42–48 for administrators; that predominant faculty respondents are instructors, and the administrators are holding the positions as deans, and chairman/department head/coordinators of research; that most of them only earned units in master’s degree; and the factors that tend to strengthen the description on research culture are research experiences, leadership skills in research, and attitudes and personal interest in research. Moreover, findings on materials resource factors reveal the need to improve and strengthen (i) the system of funding research; (ii) availability of research facilities and research journals and publications; and (iii) the library facilities, holdings, and materials. However, information technology variable is significant in building research culture.

Descriptive findings on research capability show the manifestations of positive research management and competence of administrators and faculty in processing research. In addition, findings on research outputs reveal the need to improve both the type of research conducted and the number of research published and presented, and to increase the publication. Findings reveal that there are more unpublished researches than the published ones. Results of the study on research dissemination indicate the need to strengthen the scheme of effective communication or diffusion of research outputs. However, findings on research utilization reveal to the much extent of its user but it calls for a mechanism to facilitate, monitor, and evaluate research utilization.

Regression relationship analysis showed that research capability as to research management is dependent on variable position, training, and research experiences; and research process is influenced by leadership skills in research, personal interest and attitudes, educational attainment, length of service, training, and research facilities.

A similar positive relationship is revealed between research outputs and independent variables; factors that tend to strengthen the link between the two are research mission-vision, goals, and objectives of research, research rewards, length of service, position, educational attainment, information
technology, leadership skills, and research orientation. There is significant relationship between research dissemination and independent variables research rewards, position, age, leadership skills, library facilities, agenda and priorities in research, goals and objectives in research, and foreign funds. Moreover, factors that tend to strengthen the link or relationship between research utilization and independent variables are attitudes and interest in research, research networks and linkages, age, research training and library and library facilities, holdings and materials.

**INTRODUCTION**

Society is entering an era in which the future will essentially be determined by the people's wise use of knowledge, a precious global resource that embodies human intellectual capital and technology particularly in research. People begin to expand their understanding of generated knowledge as an essential asset of anticipating the future.

For the best part of the decade, research has been playing the vital role of generating knowledge in response to the issues and challenges of this millennium. Research has helped identify many problems that affect human life. Problems in daily life should be solved and given due attention. Time and resources should not be wasted on a trial-and-error means of problem solving.

Studies in the 1990s show that higher education institutions play a significant role in conducting productive research. These institutions of higher education are seats of dynamic research activities and centers of creativity, development, and excellence where recent theory and practice in various fields of human endeavor and data and information are readily available for public utilization.

The challenge of globalization demands critical attention to research in order to generate knowledge and discover new strategies for improving the quality of human life. Through the years, however, research that could help in their solution seemed to have been neglected and undervalued. There are administrators of higher education institutions who believe that their sole primary function is instruction and that research is expensive, time-consuming, and not affordable. Research, however, is meaningful and productive. Its benefits are gauged in terms of the extent and direction of the growth and development of a growing society like the Philippines.
In the Philippines, where the culture and environment for research are not well developed, it is essential for the institutions to place emphasis on research to enable this country to join the ranks of world class nations this millennium.

However, the question is whether a research culture has already been truly established in higher educational institutions. What does research culture in the state higher education institutions imply?

**Conceptual Framework**

This study focused on the status of the research culture in state higher education institutions in Region IV is premised on the belief and thinking that it is the duty of higher education institutions to initiate and conduct dynamic research, and to generally enhance both instruction and extension services in all higher education institutions through research in order to generate knowledge that can help solve problems that beset society.

The study is likewise based on the belief that research and studies (Deza, 1999) should be conducted primarily for the delivery of quality education in order to cope with the challenges of globalization or internationalization (UNESCO, 1999), and to fulfill the research function of higher education institutions (HEIs) in the Philippines as decreed in the Education Act of 1982 (as cited by Banaag, 1994), to advance knowledge through research, and apply new knowledge to improve the quality of human life and respond effectively to fast changing societal needs and conditions of this millennium. Pursuant to Republic Act No. 7722 (CHED, 1994), CHED is mandated to ensure and protect the advancement of learning in higher education institutions through productive and useful researches.

The study is also premised on the concepts of Deza (1999); Banaag (1994); Michalak and Friedrich (1981); Ricafort (1995, 1997); and Alcala (1997), among others, that research culture is implied by the relationships of four components of variables such as research capability, research output, research dissemination, and utilization significantly influenced by institutional research program factors, human, and material factors shown in Figure 1.

The study focused on the four components of research culture such as research capability, research output, research dissemination, research utilization, and research climate as predicted by institutional research program factors, human resource factors, and material resource factors.
Objectives

This study aimed at determining, assessing, and analyzing the status of research culture in state higher education institutions (SHEIs) in Region IV in relation to significant variable components such as research capability, research output, research dissemination, and research utilization as influenced by institutional research program, human resource, and material resource predictors.

Specifically, this study is conducted:

1. To describe the significant influence of the following institutional research program factors such as (i) research vision-mission, (ii) research goals and objectives, (iii) research policies and guidelines, (iv) research agenda and priorities, (v) research structure, (vi) research evaluation, (vii) research network and linkage, and (viii) research rewards, incentives, and recognition on the research culture.

2. To determine the significant contribution of the following human resource factors such as gender, age, civil status, position, status of position, educational attainment, research experiences, length of service, leadership skills in research, training in research, research orientation, and attitudes and interest in research on research culture.

3. To describe the significant influence of the following material resource factors such as government funds (internal), foreign funds (external), research facilities and equipment, scholarly journals or research publications, information technology, and library facilities and holdings.

4. To determine the status of research culture of the institutions as to research capability, type and number of researches conducted, and extent of research outputs dissemination and utilization.

5. To describe the problems met by respondents in relation to developing and improving research culture in SHEIs in Region IV.

Hypotheses

The following hypotheses were tested for in-depth solution of the problems:

1. The institutional research program factors do not significantly influence the research culture.
2. The human resource factors do not significantly affect research culture.

3. The material resource factors do not show significant influence on research culture.

4. There is no significant difference in respondents' attitudes and interest in research, research orientation, and leadership skills in research.

5. There is no significant difference in problems met in the development and improvement of research culture by respondents?

6. The institutional research program, human resource, and material resource factors do not significantly influence the research culture in state higher education institutions in Region IV.

7. There is no significant relationship between the variable components of research culture as to research capability, output, dissemination and utilization?

**METHODOLOGY**

**Research Design**

The study made use of the descriptive-normative method. The purpose of this is to describe, assess, and determine the prevailing research culture as influenced by independent variables.

**Subject and Respondents of the Study**

There are two groups of respondents who are involved in the study. This group of informants involved 289 respondents including 67 administrators and 222 faculty members involved in instruction and research.

**Sampling Techniques**

Complete enumeration is used in the choice of 67 administrator-respondents, and the stratified proportional random sampling is used to get the final sample of the 222 faculty respondents of the study.
Research Instrumentation

Data gathering was done using the two sets of survey questionnaires. One set was administered to the administrators and the other set to the faculty members.

The first part of the questionnaire elicited information on the respondent’s name, gender, age, civil status, present position/designation in the school, highest educational attainment, length of service in the school and in the present position, and status of position.

The second part of the questionnaire constituted the information on the variables such as:

- **Institutional research program factors**, namely: research vision-mission, goals and objectives, research structure, research policies and guidelines, research agenda and priorities, evaluation, research network and linkage, and research rewards, incentives, and recognition (RIR); **Human resource factors**, namely: training in research, attitudes and personal interest in research, research orientation, research experiences, and leadership skills in research; **Material resource factors**, namely: government fund (internal), foreign funds for research (external), availability of research facilities and resources, availability of research publications, facilities for information technology, available library facilities and resources; and the **components of research culture**, namely: capability in research (research management and research process), research outputs (types of research conducted and completed), research dissemination (publication media, academic works, and WWW channels), and research utilization.

Other data and information on research were availed by the researcher from the research documents and records of the respondent institution. The researcher interviewed some of the top administrators and faculty to gather more relevant data on research to be conducted.

Statistical Design and Treatment of Data: Descriptive Statistics

The weighted mean, standard deviation, frequency counts, percentages, and rank were used to determine and describe the variables, namely: institutional research program, human, and material resource factors, and the components of research culture as to capability in research, research outputs, research dissemination, and utilization.
RESULTS AND DISCUSSION

Characteristics of the Variables

The general description of the institutional research program factors, namely; research mission-vision, goals and objectives, research structure, research policies and guidelines, research agenda and priorities, evaluation, and research linkage and networks as manifested by their reactions and beliefs is significantly “high” (AWM = 3.56) or 50% better than the minimum standards. However, there was an “average” (AWM = 2.83) compliance with the minimum standards on research networks and linkages.

Research Rewards, Incentives, and Recognition

The result reveals that promotion ranks first among the rewards, incentives, and recognition (RIR) provided by each institution to the research efforts the respondent schools with 39 respondents affirmed. This concurs on the findings of Gibson et al. (1994) in Kats and Coleman (2001) that promotion is a form of extrinsic type of reward that positively influences workers to produce quality output. Local training on research is provided when there is a research effort conducted as 38 out of 289 respondents affirmed. Honorarium (30), theses, and dissertation supports (25) are another form of incentives provided by each institution.

Human Resource Factors

The data revealed that respondent groups are predominantly males and married. Most of them belonged to mean age of 45 years for administrators and 37 years for faculty. The mean position of 2.25 indicates a predominantly faculty respondents who had occupied instructor positions; and most of the administrator-respondents had occupied positions as deans, and chairman/department head/coordinators of research with the length of service. It is also noted that there was a predominance of respondents who are permanent in their positions. It is noted that mean length of service is 10 years (with SD = 8.12) for faculty and 17 years (with SD = 9.34) for administrators.

The finding shows that the average (AWM = 2.65) compliance with the minimum standard of the educational qualifications indicated that most of the respondents earned units in master’s degree levels. The results shown that the research experiences of the respondent groups described to be “high” (AWM = 3.65) or 50% better than the minimum standards. In contrary, they revealed that the trainings they have attended are “low” (AWM = 2.26) or 50% less than the minimum standards since majority of them attended one
research training related to research compared to others who attended research trainings.

However, the respondent groups “agreement” on the leadership skills in research (AWM = 3.25), research orientation (AWM = 2.98), and attitudes and personal interest in research (AWM = 3.17). These are significant factors in building the research culture in their institution.

Material Resource Factors
There are “low” (AWM=2.04) government funds since only 1–2% of the total school budget is allocated for research, and “very low” foreign funds in research with AWM of 1.13. Respondents revealed the availability of research facilities (AWM=1.51) as 60–69% available, and research journals or publications (AWM=1.59) as “very low” or 50% less than the minimum standards. It shows that there is a professional journal per discipline. Hence, the library facilities with the AWM = 2.03 were “low” in its library holdings, facilities, and materials. However, there was a “very high” compliance of standards in terms of information technology facilities (AWM = 4.19).

Components of Research Culture

Capability in Research. The respondents believed that there was (AWM = 2.90) a “much extent” on the research management of the respondents. Moreover, they believed that they had the “competence” to process research, with the average weighted mean of 3.24.

Research Outputs. The most conducted researches in the respondent schools are the T3 or the graduate researches (theses and dissertations) with the total number of 50, which is 20 for administrators and 30 for the faculty. Thus, graduate researches are done as an academic requirement or as an introduction to students into the world of generation of knowledge in research. The Type 2 or faculty researches, with the number of 40 which is 10 for administrators and 30 for the faculty, show that teachers are getting involved in research to achieve the standards of excellence in generating knowledge and information. However, the least conducted type of researches in the respondent schools is the commissioned research. With the least number of researches, the finding implies that commissioned research finds difficulty as regards the allocation of funding since it is funded externally.

Research output refers to the research productivity of institution as indicated by quality type of research being published.
The number of published research outputs by respondent SHEIs in Region IV. It reveals that the number of published research outputs is “negligible.” As findings also show that there are 239 or 82.70% more “no research outputs” respondents than those 50 or 17.30% “with published research outputs.” Forty-four or 15.22% of the total respondents (Adm = 10 and Fac = 34) responded that the number of published researches in their institution is less than 3. However, a respondent reacted that the number of published research outputs range from 9 to 11.

Just to carry out a research output is not enough. The AWM rating of 0.31 of the respondents indicates “negligible.” This means that completed researches are not extended or disseminated by means of presentation in any media channels of dissemination. The figures also reveal that there are 44 or 15.22% out of the 289 informants who reacted that there are only less than three researches are being presented. Five or 1.73% of them responded that the number of researches presented ranges from 3–5. While, four of them reacted that they presented research outputs 6 or more. The small number of researches being presented would imply the lack of effective mechanisms of enhancing research interest among the administrators and faculty; availability of budgetary allocations or funds; and research rewards, incentives, and recognition.

The number of unpublished research outputs was perceived by the two respondents to be “very high” as also revealed by the AWM = 4.70. The overall average weighted mean of 4.70 of the informants, which indicates the weighted mean ratings of administrators (4.52) and faculty (4.82) implies “very high” as regards the non-publication of research outputs. The figures also reveal that there are 240 or 83.04% of the informants who have “no research outputs” compared to those 49 respondents who have the “unpublished” research outputs. This means that many of them are still unaware of the presence of research function in their institution. The non-publication of research outputs may mean the following: difficulties associated with pressures for research; research activity is not appropriate to generate ideas; research output is irrelevant; and no funds available (Ricafort, 1995).

Research Dissemination. The dissemination of research is described as to much extent. It is believed that the respondents used research journals, newsletters, bulletins, and research magazines to be the channels of research findings/outputs in their institutions. To some extent the respondents also utilized the academic works such as the seminar/workshops, speeches and lectures, conferences/conventions, and professional meetings. Very few of them used the WWW channels as the media of research outputs.
Research Utilization. The research culture as to the extent of research utilization was perceived to be a “much extent,” with the AWM of 2.74. In contrary, there was a small total of type of researches being utilized by the institution. Only 36 research results were used for (i) administrative policies; (ii) administrator/faculty/staff development; (iii) curriculum development; (iv) improvement of instruction; (v) community development; and for (vi) extension development.

Research Problems. Respondents reacted that the most serious issues and concerns that they actually have is the “inadequacy of time among administrators and faculty to process research.” This implies that they have more time on teaching than conducting research. This is confirmed by the present finding that “deloading” of subjects is the “least” incentive provided by the institution to those who have research efforts. Another problem that besets the conduct of research is the “insufficiency of funds” (AWM = 3.07). With this, the institution should find means to augment the conduct of research and to maintain it, as funds are indispensable to the management of research. This can be done by responding to the “need for a national research organization to coordinate research efforts in education” (AWM = 3.02). This implies effective linking and networking. These will make the administrators and faculty aware of the opportunities for collaboration of research funding and efforts in education. They also revealed that the “support of the government in terms of research is inadequate” (AWM = 2.99).

The least ranked serious problems are poor leadership (AWM = 2.71); lack of impact of research on instruction (AWM = 2.71); research priorities and agenda that are too limited or not clear (AWM = 2.70); and inadequate support from the administration (AWM = 2.67).

Regression relationship analysis showed that research capability as to research management is dependent on variable position, training, and research experiences; and research process is influenced by leadership skills in research, personal interest and attitudes, educational attainment, length of service, training, and research facilities.

A similar positive relationship is revealed between research outputs and independent variables; factors that tend to strengthen the link between the two are research mission-vision, goals, and objectives of research, research rewards, length of service, position, educational attainment, information technology, leadership skills, and research orientation. There is significant relationship between research dissemination and independent variables research rewards, position, age, leadership skills, library facilities, agenda and priorities in research, goals and objectives in research and
foreign funds. Moreover, factors that tend to strengthen the link or relationship between research utilization and independent variables are attitudes and interest in research; research networks and linkages; age; research training and library; and library facilities, holdings, and materials.

CONCLUSIONS

In conclusion, the significance of respondents’ awareness of research program factors is extremely contributory to the development of SHEIs research culture. The manifestation of respondents “high” compliance with the research minimum standards is an implication of explicitly stated research program on office documents. Therefore, an index to a creative and dynamic research culture is objectively and deeply accounted to put-into-practice and implemented research programs of an institution. It is important that the institutional research programs are clear to the members of the faculty and administration.

Similarly, the implementation of the research program is purposely done to some extent. Determining variable like position/designation has essentially influenced its effectiveness. Respondents’ educational background, research orientation, experiences, and trainings, leadership skills in research, and attitudes and interest in research are significantly contributory to the building of a wholesome research culture.

However, there are some reasons that hinder the development of research in SHEIs. Inadequacy and unavailability of local and foreign funds, research facilities, publication, and library facilities prevent the positive take off of research culture. Average systems of linkage and networks give way to low level dissemination and communication. Thus, material resource factors require prioritization and attention in order to create a dynamic type of research culture.

It is also equally important to note that research management plays a great role in building the culture of research in SHEIs in Region IV. This indicator of research capability simply considers to a much extent the major contribution of respondent’s position/designation, status of position, trainings, and experiences in research. The research culture is also achieved when the respondents do have the “competence” to process research. This concludes that the respondent groups’ manifestations of positive attitudes and interests towards research, good educational qualifications to conduct researches, skills in leading the people to do and engage into a quality researches, availability of research facilities, length of service, and even trainings do a lot to effect and develop research culture.
Researchers are not born overnight, and track records in research are developed over the years. Institutional commitment must be supported not only by logistics but also by research orientation, leadership skills, experiences, patience, perseverance, and trust.

**RECOMMENDATIONS**

On the basis of the findings and conclusions, the researcher recommends the following recommendations:

1. **Strict observance in the implementation of research programs** (research mission-vision, goals and objectives, research structure, research policies and guidelines, research agenda and priorities, evaluation, implementation, network and linkage, and rewards, incentives, and recognition) is an indicative of quality type of generation knowledge. However, it is recommended that the system of research networks and linkages should be given much attention and prioritization be it local, national, or international, because developing the research capacity is taking essentially into consideration the effective means and systems of networking and linking within and outside the academic community.

2. **Administrator and faculty respondents with master’s degree units should exert efforts in finishing their courses. This is one way of making them up-to-date on the new trends in education. Bachelor degree holders should pursue graduate programs or advance studies to enhance their knowledge, skills, and attitudes professionally. Similarly, respondents who have completed their master’s degree programs must proceed to doctoral programs and other post graduate studies. It is recommended that the potential faculty and administrators should be encouraged by sending them on scholarship to any universities for graduate studies.**

3. **Since, rewards, incentives, and recognition (RIR) have significant influence on the research outputs, it is recommended that the following RIR should be regarded with much attention:**

   a. **Promotion. Researchers who exert efforts in research should be recognized by promoting them to a higher level of position be it in academe or in administration.**

   b. **Honorarium and Theses/Dissertation Support. Faculty and administrator-researchers with approved research grants should be entitled to honorarium. However, a theses or dissertation support**
should be provided by the school to those who pursue their graduate studies.

c. Subject Deloading. Faculty personnel who are designated or assigned extra assignments should be entitled to reduction of teaching load. If they conduct researches, they must be entitled to the same incentive or privilege. This will address the problem of the respondents on the “inadequacy of time to process research.”

4. Since there is an indication of “low” exposure to training, it is recommended that the administrators and faculty should (if possible) be sent oftentimes to attend trainings and seminars/workshops in relation to research. Possibly, more research trainings and seminars must be provided for them to enhance their skills.

5. An indication of “low” or “insufficient funds for research and inadequacy of research supports from the government” suggests an introduction of an effective funding mechanism.

6. The availability of research facilities and richness of research journals (local or international) motivates the researchers to do researches. The institution should look into the importance of these material resources. Provision of recent library holding and materials can do a lot to produce quality literature of research. Modern technology, for instance, should be accessible to those who conduct researches for easy processing of research, or the institution should point to journals, articles, names, authorities, institution, sites, and software.

7. The low research output implies the ineffective campaign of the research leaders to influence the faculty or even the administrators to conduct researches. It is recommended that research leaders or administrators should explain what should the researchers should know about thesis, hypothesis, research design, data (collecting, coding, preparation, processing, and analysis), project proposal, project management, project schedule, project budget, and publishing rewards, library, web, CD-ROM use, and intellectual property rights.

8. Getting research findings and results known to society is crucial for utilization and use. It is recommended that facilitation of papers and dissemination/communication using the media channels such as (i) publication media such as books, research journals, research magazines, newsletters and news releases, circulars, and bulletins; (ii) academic works such as seminars, workshops and conferences, professional meetings,
speeches, and lectures; and (iii) world-wide web such as internet, compact discs, databases, and other data summaries.

REFERENCES


ICT-Based Research and Development Program to Strengthen Rice and Banana Industry Under LGU–Industry–Knowledge Center Partnership: Experiences of the Open Academy for Philippine Agriculture in Cagayan Valley

Orlando F. Balderama 2, Biley M. Temanel 3, Alberto R. Domingo 4, and Luzviminda L. Domingo 5

ABSTRACT

This paper presents a research study on various information and communication technology (ICT) modes tested by the Open Academy for Philippines Agriculture (OPAPA) Isabela pilot site in bringing timely information to the farmers. The overall goal is to strengthen the rice and banana industry in Cagayan Valley through strategic R&D interventions with the use of ICT. Towards this end, there were five ICT interventions employed as follows: (i) farmers’ internet; (ii) farmers’ text center; (iii) mobile internet cab; (iv) e-content; and (v) ICT trainings. Extension workers and farmers are given access to the internet to be able to solve the problems in the field and in finding better price for their produce. Farmers also get information and consult experts through the farmers’ text center. The mobile internet cab was used to build awareness on ICT and train farmers on basic computer operation in the barangays of San Mateo, Isabela. Building up localized e-content is a key factor for ICT applications in agriculture since these are the information eventually disseminated to farmers and extension workers.

The above interventions were piloted through a knowledge center-LGU–industry network called “Isabela cyber

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Project Leader, OPAPA for Cagayan Valley and Research Director, Isabela State University, Echague, Isabela
3 Project Leader, Banana R&D, Isabela State University, Echague, Isabela
4 Vice President for Planning and Development, Isabela State University, Echague, Isabela
5 Chair, Agribusiness Department, College of Agriculture, Isabela State University, Echague, Isabela
community” composing of a farmers’ group, a local government unit, the Philippine Rice Research Institute and Isabela State University as knowledge centers.

The ICT extension delivery modes introduced and tested were found effective and practical and now gaining popularity not only in the pilot site but also nationwide. As a result more farmers and industry leaders are benefiting on these ICT services.

INTRODUCTION

Rationale

Many of agricultural technologies and innovations in the country do not reach the grassroots level because of the limited capacity of extension services. The national farmers-agricultural extension workers (AEWs) ratio of 200:1 illustrates the imminent and almost inevitable information gap in every development initiatives intended to help our farmers improve their production and increase their income. Not even Isabela, the rice basket of the north, was spared from this looming condition.

Through the initiative and guidance of the Philippine Rice Research Institute, the Open Academy for Philippine Agriculture (OPAPA) for Cagayan Valley Philippines and the Isabela cyber community was established in 2006 in collaboration with Isabela State University and Good Samaritan Multipurpose Cooperative as one of the pilot sites for the propagation of information and communication technologies of OPAPA. The project aims to strengthen the extension services in the province and the whole region through the use of modern technologies and different modalities designed to assist the farmers as well as the agricultural extension workers.

With the establishment of the province as a cyber community (CyberCom) it is hoped to eventually change the flow of communication and sharing of knowledge and experiences among the industry stakeholders of major crops specially rice, banana and other crops. With the implementation of OPAPA, the exchange of information is no longer limited to specialists-to-extension workers-to-farmers. Maximizing the use of modern technologies such as short messaging system (SMS/text messaging) and the internet has paved the way for fast and efficient response to answer the queries of the farmers.
The expected result of this Research and Development is to increase the awareness of the intended beneficiaries on the programs of various institutions that can help them improve farm productivity and profitability. It has encouraged exchange of knowledge and elicits participation among the stakeholders in the field of agricultural development.

**Objectives**

The general objective is to enhance the capability of extension workers and farmers through adequate, focused and fast delivery of technologies and information using ICTs with focused on supporting rice and banana industry in Cagayan Valley region.

Specifically:

1. To provide e-Learning opportunities to farmers and agricultural extension workers via ICT and distance mode.
2. To provide and develop a web-portal for the publishing of agricultural technologies, guides, information, and services to extension workers and farmers.
3. To pilot various ICT modalities in providing solutions to rice and banana industry in particular through Knowledge Center-LGU–Farmers’ Cooperative partnership.
4. To document experiences in using ICT for development.

**METHODOLOGY**

**Identification of Pilot Site**

Identification of a pilot site as a first step is very crucial. Practical criteria have been set by a team in considering a potential candidate for the partnership.

**Developing Academe–LGU–Industry Partnership**

Establishing a partnership is being done through frequent visits and constant dialog on how this partnership can be mutually beneficial for every party. The role of the every stakeholder has been laid down, and specific commitments are made.
Establishment of the Cyber Community

The establishment of the cyber community and the conduct of the study were formalized through a MOA signing. There were three MOA’s signed as follows: (i) the establishment of the Isabela cyber community; (ii) the conduct of OPAPA project; and (iii) development of an IT Cab for LGU San Mateo.

Developing Framework of ICT Modality and Implementation

The development of operational framework is important to create appreciation and provide easy understanding on what and how ICT modes are employed, and who are the players and beneficiaries.

Benchmark Survey

A 4-month survey prior to the launching of ICT services was conducted to gather data in relation to the information needs of the farmers.

Conduct of Focus Group Discussion Study

A Focus Group Discussion (FGD) is a rapid assessment, semi-structured data gathering method in which a purposively selected set of participants gather to discuss a list of issues. The conduct of FGD was undertaken to identify the focus commodity and particular technological needs as a basis for training and content development. The FGD guide questions used can be seen in the annex section.

Conduct of ICT Trainings

Trainings to farmers, extension workers, farmer leaders and barangay technicians on various topics of ICT were conducted. This series of activities is aimed to create awareness, instill interest and develop skills on ICT among the various users.

Installation of Farmers’ Internet

Two dedicated farmers’ internet kiosks were established at Good Samaritan Multi-Purpose Cooperative, San Mateo Isabela and at OPAPA office at Isabela State University. Under the project, farmers can freely use the internet workstation in finding information needs through the OPAPA website.
Launching of Banana Text Center

The banana text center was the first to be initiated in the country. Since banana has become a major commodity in Cagayan Valley and ISU as the R&D and knowledge center, the text center will certainly enhance and fast track the development of the banana industry in the region.

Launching of IT Cab

The overall objective of the IT Cab is to provide onsite trainings to agricultural extension and farmers on the use of computers and access agricultural information that are available online. On September 3, 2008, the OPAPA Isabela inaugurated and turned over an Information Technology Cab project equipped with laptop computer with internet connections to LGU San Mateo.

MANAGEMENT APPROACHES, STRATEGIES, AND INNOVATIONS APPLIED

Pinoy Farmers’ Internet and Web Portal

Two dedicated farmers’ internet kiosk was established at Good Samaritan Multi-Purpose Cooperative, San Mateo, Isabela and at OPAPA office at Isabela State University.

The users of the facility are easily acquainted by simply logging on to http://www.opeacademy.ph and access the contents and services available in the web portal such as Technolips, e-Learning, i-Learn Rice, Experts Online, FAQs and e-commerce. Also by logging on to http://www.isu.edu.ph for information on banana, fancy rice, corn, high-value vegetables, biofuel (sweet sorghum, jatropha and cassava) and small ruminants.

ICT Training for Farmers and Agricultural Extension Workers

OPAPA Isabela conducts online and face-to-face training on web tools and distance learning to upgrade the competencies of agriculture extension workers. This component recognizes the important role of agricultural extension workers in bringing information technologies within the farmers’ reach and the need for the technicians to keep abreast with the latest on rice science and technology, banana, corn, high-value vegetables and biofuel crops (sweet sorghum and jatropha).
Farmers’ Text Center

This is a 24-hour (Monday to Friday) SMS-based helpdesk and customer support that links experts, extension workers and farmers by answering queries on rice, banana, corn, high-value vegetables and biofuel crops (sweet sorghum and jatropha) through text messaging. To avail of the expert consultation services on agricultural technology, a user can key in on their mobile phones REG/Name/Age/Address/Occupation and sent to 09214753011.

Cyber Community

The Isabela cyber community in Region 2 is one of the 12 cyber communities nationwide that was established to test the effectiveness of linking organized groups to knowledge centers, local government units, farmers’ coop or groups and markets through ICT. This strategy aims to improve collaboration among government agencies to provide timely, appropriate and useful information and technology to farmers.

Mobile Internet Cab (MIC)

The project was jointly funded by PhilRice and LGU San Mateo for the use of OPAPA Isabela cyber community. The IT cab will be used primarily to penetrate remote barangays of San Mateo for IT-based agricultural extension activities. The mobile internet cab is being used to provide ICT awareness and trainings to farmers and extension workers in the barangays. The facility is self-contained internet cab equipped with four laptop computers that have wireless connections.

DISCUSSION

Benchmarking Studies

From January to May 2007, a study was conducted to obtain benchmark information to determine ICT needs and the most appropriate intervention that will be introduce in the cyber community. Data gathering was done through focus group discussion (FGD) and household survey. Through FGD with selected farmers and agricultural extension workers, top agricultural commodities were identified including the specific technologies to be given focus. The household survey was undertaken with the participation of 64 farmer-respondents at San Mateo, Isabela. Information collected and analyzed was as follows:
• Socio-economic profile of the farming community
• Problems in farming
• Farming practices (production, water management, pest management, harvest and post-harvest operations)
• Information seeking behavior
• Information needs in farming
• Information access
• Text messaging awareness
• Computer/internet use
• Other information needs

Developing Framework of ICT Modality and Implementation

![Diagram](image)

**Figure 1.** ICT modality and implementation network.

The above diagram shows the framework on how ICT modalities are implemented through trainings, web portals and text center covering the entire production to marketing chain of the focus commodities.
Test of ICT Services

a. The Farmers’ Internet

The two farmers’ internet kiosks were set up at the Good Samaritan Multi-Purpose Cooperative, San Mateo, Isabela and at OPAPA office at Isabela State University. Under the project, farmers can freely use the internet workstation in finding information needs through the OPAPA website. The set-up at ISU is more comprehensive as the farmers’ internet kiosk is complemented by a text center and a community radio station. Most clients at ISU are OPAPA trainees, students in ICT walk-in farmers and extension workers.

b. Documentation of Good Practice of ICT for Development

Documentation of two farmer leaders in the cyber community was conducted and their success stories were published in the OPAPA website. An example is found in the annex section of the paper.

c. Content Development

Various educational and instructional materials were developed and uploaded for online publishing. Farmers who have access to computer and internet connection need not bother to look for subject matter specialists for additional knowledge. Fact sheets and crop production guides are now downloadable from the OPAPA website. Some are even translated into local dialects for easy understanding. Listed below are the materials developed by OPAPA Isabela Team:

- Frequently asked questions on banana production
- Techno guide for saba banana production in Cagayan Valley
- Techno guide for lacatan production in Cagayan Valley
- Hybrid corn (Ilocano version)
- Paggamit ng potasyo sa palay
- Dagiti rumbeng a maamuan panggep iti rice blast
- Yellow stemborer (Ilocano version)
- Panangatipa iti bacterial leaf blight
- Why proper drainage is important in banana farms?
- Banana based farming systems
- How to control black sigatoka
- How to control banana freckle
- Diagnosing and controlling bugtok disease of banana
- Banana bract mosaic
- Banana bunchy top virus

Competing Papers 33
• Small scale mango processing (Ilocano version)

Table 1. Basic ICT trainings conducted in Isabela CyberCom.

<table>
<thead>
<tr>
<th>Trainings</th>
<th>Date</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For AEWs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic ICT for agricultural extension workers</td>
<td>July 17–18, 2006</td>
<td>25</td>
</tr>
<tr>
<td>Empowering agricultural technologists through ICT for an enhanced extension delivery system</td>
<td>October 17–18, 2006</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>July 17, 18, 24, 24 and 31, 2008</td>
<td>88</td>
</tr>
<tr>
<td><strong>For farmers (cooperative)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic ICT for coop members if GSMPC</td>
<td>July 27, August 4, 2008</td>
<td>50</td>
</tr>
<tr>
<td>Hands-on training for farmers</td>
<td>January 14, 2007</td>
<td>25</td>
</tr>
<tr>
<td>Training on RKB for San Mateo farmer-led extensionists</td>
<td>February 27, 2008</td>
<td>28</td>
</tr>
<tr>
<td>Workshop for Palayamanan and PalayCheck as banner programs of PhilRice</td>
<td>May 2008</td>
<td>98</td>
</tr>
<tr>
<td>Introduction to OpAPA, MOET and drum seeder</td>
<td>October 28, 2008</td>
<td>27</td>
</tr>
<tr>
<td><strong>For farmers (in 10 brgys)</strong></td>
<td>November 24 to 30, 2008</td>
<td>200</td>
</tr>
<tr>
<td><strong>For barangay technicians</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technician training on basic trouble shooting and maintenance of computer facilities in the barangay</td>
<td>October 22, 2008</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>594</td>
</tr>
</tbody>
</table>

d. Trainings and Advocacy

Meetings, orientations, consultations, focus group discussions (FGDs) and hands-on ICT trainings played an important role in promoting the OPAPA services. These activities were undertaken to establish networks and partnership with different groups and institutions and to gauge the readiness of the stakeholders involved in the implementation of the project. Below are the training conducted by the project from 2005 to 2008. In addition, the project has been very active in promoting OPAPA services through participation to field days, expos, fairs and the like.
e. Farmers’ Text Centers

One of the most innovative modality employed was the Banana Text Center in Isabela State University (ISU) Echague Campus. Farmers and AEWs became more active in networking and sharing of information because of the establishment of the text center. The convenience and mobility offered by handheld phones provided avenue for empowerment of the OPAPA beneficiaries. Farmers’ text center received and answered a total of 420 since it started in January 2007. Through the text center frequently asked questions (FAQs) on banana has been determined and published at OPAPA website. Figure 2 and Tables 2 and 3 show the number and type of questions received at the text center.

![Figure 2. Categories of text queries on banana.](image)

f. First Mobile IT Cab

The strong advocacy at Isabela cyber com resulted to mobilizing the local government unit (LGU) of the town of San Mateo to go for the extra mile in supporting the project, literally and figuratively. They donated a multicable to have a small version of the mobile internet bus (MIB) in their town. PhilRice financed the conversion of the vehicle and set up of four units of laptop computers. Later on, it became the very first mobile IT cab in the
country. Figure 3 shows the mobile IT cab used for technicians’ trainings in the barangays.

Table 2. Text messages and categories of topics received and answered by Banana Text Center in ISU, Echague, Isabela since it started in January 2007.

<table>
<thead>
<tr>
<th>Category</th>
<th>2007</th>
<th>2008</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Site selection</td>
<td>15</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>b. Planting/variety</td>
<td>25</td>
<td>35</td>
<td>60</td>
</tr>
<tr>
<td>c. Cultural management practices</td>
<td>61</td>
<td>65</td>
<td>126</td>
</tr>
<tr>
<td>d. Insect pests and disease</td>
<td>76</td>
<td>70</td>
<td>146</td>
</tr>
<tr>
<td>e. Harvesting</td>
<td>8</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>f. Post-harvest</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>g. Investment cost/income</td>
<td>15</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>h. Marketing</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>220</strong></td>
<td><strong>200</strong></td>
<td><strong>420</strong></td>
</tr>
</tbody>
</table>

Table 3. Frequently asked questions on banana.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ano po ang dapat sundin upang ang tanim na saging ay maging malago?</td>
<td>Dapat sundan yong ibat-ibang cultural management practices, i.e fertilizer application at pag gamit ng hormones (brassinolide and GA3), weeding, stem and mat sanitation, deleafing, irrigation and proper drainage at iba pa. Latundan at saba</td>
</tr>
<tr>
<td>Anong variety ng saging ang madaling itanim at madaling ibenta ngayon?</td>
<td></td>
</tr>
<tr>
<td>How to prevent or control the growth of white worms thriving in the leaves of Banana? These worms consume the leaves, is this lethal to the plant?</td>
<td>If the infestation is during the early vegetative stage, okay lang at makarecover din yong saging, pero pwede ka ring magspray ng insecticide to kill those army worms. If during dry months, potassium deficiency ito, but kung may available water or during rainy days, sigatoka disease ito especially sa lakatan, latundan and bungulan. If the wilting or yellowing is experienced in latundan at nag start ang yellowing ng leaves sa older leaves- fusarium wilt ito.</td>
</tr>
<tr>
<td>What disease characterized by wilting-like leaves of banana?</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Continuation...

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some banana planters are telling that banana grow better in a land where cogon and talahib grow robustly. Is this true?</td>
<td>Mas maganda ang growth ng banana sa areas where talahib grows.</td>
</tr>
<tr>
<td>What variety of banana is applicable for a water log area?</td>
<td>Any variety ng banana can be planted in these areas, kailangan lang mag construct ng drainage canals do drain off excess water.</td>
</tr>
<tr>
<td>How many varieties of banana already exist in the Phil?</td>
<td>We have more than 80 varieties classified by Valmayor, et.al</td>
</tr>
<tr>
<td>What particular place where we can find the largest plantation of banana here in the Phil?</td>
<td>We can find the biggest plantations of banana in Davao and the rest of Mindanao where the climate is very favorable.</td>
</tr>
<tr>
<td>What specific variety of banana is good for exportation</td>
<td>The Cavendish type is the most popular export variety for fresh market, while Saba is for processing i.e. banana chips.</td>
</tr>
<tr>
<td>Ano po ang bagong variety ng banana?</td>
<td>We have several hybrid bananas ngayon and one of this PHIA 18 has the potential for export sa USA for fruit cocktail.</td>
</tr>
<tr>
<td>What are the different diseases of banana?</td>
<td>We have several diseases of banana that are caused by viruses, bacteria and fungus.</td>
</tr>
<tr>
<td>What climate or season is suitable in planting banana?</td>
<td>We usually start planting bananas at the onset of the rainy season, para during the typhoon months malit pa yong saging.</td>
</tr>
<tr>
<td>What is the best location to plant banana</td>
<td>The best location is where there is source of water, with medium clay loam to sandy loam and with natural wind barriers.</td>
</tr>
<tr>
<td>What is the appropriate distance of applying fertilizers from the banana plant to have a good yield?</td>
<td>20 cm away from the base of the plant if they are still young and up to 50 cm if they are already at the fruiting stage.</td>
</tr>
<tr>
<td>Ano ang pinakamalit na saging na nagbunga na?</td>
<td>Meron tayong Dwarf cavendish na more than 1 m ang height.</td>
</tr>
<tr>
<td>Ano ang pinakamasaarap na saging?</td>
<td>Sa taste ng Filipinos lakatan, but sa Americans, Japanese and Europeans cavendish</td>
</tr>
<tr>
<td>Ano ang pinakamaraming nutrients na makukuha sa different variety ng saging?</td>
<td>Banana is a complete food, but ang pinakamaruming makuha sa saging ay potassium.</td>
</tr>
<tr>
<td>What is the correct way or distance of planting banana?</td>
<td>The distance will depend on several factors, i.e., variety (tall vs. short), economics, population management, location (flat vs. hilly), etc.</td>
</tr>
<tr>
<td>What is the best cure for the banana disease that produces spots on the banana leaves?</td>
<td>Proper nutrition and water to prevent the occurrence of diseases, and use fungicides to control these diseases.</td>
</tr>
</tbody>
</table>
POLICY IMPLICATIONS AND RECOMMENDATIONS

- Adoption of ICT modalities in agricultural extension is most effective when strong alliance is in place with knowledge centers, LGU, entrepreneurs and farmers’ group.
- The strong advocacy campaign on ICT use through several modalities should have follow-up activities geared towards attaining the desired impact of higher agricultural productivity by farmers and enhance the development of an agricultural industry.
- The success obtained in the pilot site being replicated by other farmers cooperative in the region.
- The enhancing of the cyber community to utilize ICT resources for non-agricultural activities and purposes.
- The institutionalization of the program and partnership among stakeholders.

REFERENCE


Comment [u1]: To the authors: please cite this reference in the text including the year of publication.
ANNEX

SUCCESS STORY: Retired but never get tired

What life would be after retirement? Retirement might coincide with important life changes, where a retired worker might move to a new location, travel to places and enjoy the pledge of being a retiree—that is away from the anxious and stressful task in any government institution. Others may take it as a chance for a long-term vacation, but not to Engr. Loreto Lazaro of San Mateo, Isabela. A retired irrigation engineer by profession; a farmer-advocate by heart. He said that as a graduate of an agriculture course, he would be able to apply his expertise in farming.

At his age, 69, who would say that Engr. Lazaro didn’t make it to farming? Apart from his farm, he also leads the agricultural community of San Mateo. To date, he is the Chairman of the Board of Trustees of the Eveland Christian College for six years now, Chairman of the board of directors of the Good Samaritan Multi-Purpose Cooperative for 16 years now and lately, appointed as Magsasaka Siyentista (MS) of San Mateo FITS.

He had also been attending numerous seminars and trainings here and outside the country. To name a few, he was sent to Japan for a nine-month training on Rice Production and Mechanization sponsored by Japan International Cooperation Agency (JICA) in 1974. He also attended a one-month training in Singapore for Advance Leadership Training. In 1992, he and his wife were able to attend a training on Central Conference of the United Methodist Church at Lowville Kentucky, USA.

Engr. Lazaro has been practicing diversified farming system in his two-hectare farmland. Like most innovative farmers, he maximizes the use of land, integrating different commodities in his farm holding. Aside from rice, vegetables and different fruit bearing trees, he has developed a backyard fishpond with tilapia on it. The engineer also raised poultry and piggery. However, he is still planning to produce organically grown pigs or locally known as “buro” to avoid the use of commercial feeds.

The engineer-turned-farmer has abandoned the use of too much commercial fertilizers and as a substitute he makes use of chicken dung and other organic fertilizer in his farm, specifically in vegetables and other fruit trees. Moreover, in his 7, 284 sq. m direct seeded rice, he uses Grow More...
fertilizer mix with 2/3 liquid zinc and 100 L of water. Instead of using the usual sprayer, he uses Knapsack Power Supply to reduce the use of bulky and heavy sprayer and it would be easy for them to spray fertilizer in his rice.

Innovative farmer scientist as he is, never gets tired of searching for technologies to apply in his farm and also asks agricultural experts for their technical assistance, especially in his rice and banana plantation. Engr. Lazaro appreciates the use of “farmers’ internet” or the information highway, a web-based bulletin board where farmers can relay their problems either through the use of their cellphones or through their personal computers. From emails or text messages, that features the Open Academy for Philippine Agriculture (OPAPA) Rice Doctors, dubbed as rice experts. Engr. Lazaro said that farming is made easy with the use of this technology. Now, he can order fertilizers through email, or contact other farmers through text messages. Not only benefits in farming, he has also personal benefits from using the internet. He was able to communicate with his children who are now in Canada, United Kingdom and in the United Arab Emirates through chat.

As Chairman of the Good Samaritan Cooperative, many farmers including all members of the coop are seeking for his advice. A question on the benefits of planting banana is the most frequent questions from farmers he could still remember as an engineer.

He admits that his feat of becoming a farmer adds knowledge that he now applies in his farm. Aiming for this title, the engineer received various awards such as the Outstanding Citizen of San Mateo in 1990, awarded as the Most Outstanding Coop Leader of Isabela in 2006 and just recently awarded by the Cagayan Valley on Agriculture Research Resources and Development (CVARRD) as Magsasaka Siyentista (MS) in 2007.

In reminiscing the past, the obstacles and the hardships in farming he has gone through, this retired-engineer is worth all the successes he now receives. When asked about his dreams, he is looking forward to seeing his grandchildren climbing the trees he planted.
APPENDIX

Focus Group Discussion on ICT needs of the Pilot Site (December 11, 2006)

Participants

- Good Samaritan Cooperative personnel
- Chairman, BOD
- BOD
- Manager
- OPAPA/B2B technician
- Farmers (corn, rice, banana, mungo and vegetables)
- Local government units (LGUs)
- Municipal agriculturist office

Results of the FGD

I. OPAPA

- Concept of ICT and OPAPA
  a. Implementers

  The GOODSAM implementers have an adequate working concept of the OPAPA project as a support service to their agri-based activities. This is indicated by their participation to the B2B and the hiring of a staff with IT degree.

  b. Farmer participants

  Only one of the farmers had adequate working concept of OPAPA and its uses.

II. Use of ICT and FITS

  1. Minimal number of farmers accessed the Framework for ICT Technical Support (FITS)/K Agrinet. They were not aware of the existence of FITS. Furthermore, the interconnectivity of San Mateo K-Agrinet is not yet working as of December 2006.

  2. If they will be given the interconnectivity, who will be its major clients? It will be the farmers. The following strategies were recommended by the farmers and management of the cooperative.
• Training of cluster para ICT communicator (Every barangay should have their para-ICT communicator).

3. What ICT services/programs would benefit the rice and banana farmers?

a. All of the farmers identified the following needs:

• Trainings on use of computers.
• Access to technologies that can be downloaded and played in VCD/DVD. The farmers can access these during the night and during their rest periods using their VCD players.
• Availability of information in fact sheets.
• The need to access the technologies in the OPAPA using a computer if possible free of charge. The manager agreed to dedicate one of the six computers for OPAPA use when the farmer members would like to use it.

b. Commodities identified for inclusion in the OPAPA website in downloadable forms.

Banana
• Production technologies
• Marketing of the product
• Diseases in pictures
• Best practices in video

Rice
• Information on varieties and their characteristics
• Marketing, prices and advertisement
• Diseases for surveillance and reporting

Corn
• Production
• Diseases
• Use of appropriate weedicide
• Marketing

Vegetables and mongo
• Diseases
• Weeding

Mango
• Processing
III. Banana as an important commodity

1. How does banana fit into the farming operations of the members and the cooperative?

Banana is an alternative source of income of the farmers after rice. It could be grown with minimal labor cost when stricken by storm unlike rice where you will lose everything. For the cooperative, they decided to put up a 5-hectare banana farm including post-harvest facilities to supply the growing demand for fresh banana.

2. Marketing

The marketing aspect of rice and banana trading will be supported by B2B and OPAPA.

Carlos M. Pascual, Miriam E. Pascua, Carmelo J. Esteban, Arnold F. Dumaoal, Phebe M. Pasion, Irma P. Acebedo, Norman A. Agualdo, Fredelito I. Yadao, and Elizabeth P. Pascual

ABSTRACT

The Affiliated Renewable Energy Center (AREC) at Mariano Marcos State University (MMSU) was borne out of the idea of partnership. Through partnership in 20 years MMSU–AREC survived, transformed and sustained operations to gradually become today a significant role player in the renewable energy sector. This paper attempts to share the experiences MMSU–AREC has accumulated though the years on the subject. On the whole, the experience can be conceived as a deliberate, sequential and logical model forwarded as the Renewable Energy Systems Partnership Management (RESPM) Framework. This framework is a partnership management approach and strategy consisting of a systematic specification and detailing of intentions and actions in the pursuit of collective goals and objectives. At the base of the framework are the fundamentals consisting of the two basic motivations of partnerships. From the fundamentals are the three general derivatives (GDs) that encapsulate the key bases in managing partnerships. The GDs are next detailed.

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Project Manager, Affiliated Renewable Energy Center (AREC), Mariano Marcos State University, Batac, Ilocos, Norte
3 Project Consultant, Affiliated Renewable Energy Center (AREC), Mariano Marcos State University, Batac, Ilocos, Norte
4 Study Leaders Affiliated Renewable Energy Center (AREC), Mariano Marcos State University, Batac, Ilocos, Norte
5 Research Specialists, Affiliated Renewable Energy Center (AREC), Mariano Marcos State University, Batac, Ilocos, Norte
through 11 particulars which specify the concrete elements of partnership management and which are ultimately translated into corresponding management strategies, tactics and activities. The detailed discussions in the paper discloses the operations of the framework with implications of their contributions to enriching the theory and principles of and their significance to the practice of managing research and industry partnership in the energy sector in particular and in other research and development areas in general.

BACKGROUND

The Affiliated Renewable Energy Center (AREC) at Mariano Marcos State University (MMSU), located in Batac City, northern Philippines, was born 20 years ago in 1989. That time, the concept and the subject of renewable energy systems (RES) were just dawning upon society dominated by the idea, economy, and technology of conventional energy systems (CES).

Right from inception and birth, AREC was a product of the idea of partnership. First known as the Affiliated Non-Conventional Energy Center (ANEC), AREC was conceived by the Department of Energy (DOE) as a proactive structural move to address the problem of and the pursuit of energy security based primarily on non-conventional energy systems (NCES). The move is unique in that it endeavored to veer attention away from the CES which from time to time are posing problems to the management of the economy. In recent times, the problems associated to the use if not dependence with CES have grown big and more complicated to now include the environmental and ecological. As a structural move, DOE established formal partnership with higher education institutions (HEIs) nationwide. These HEIs are to serve as the decentralized and area-based extension arms of the DOE to assist in carrying out NRES programs and projects in their respective areas of coverage.

Today, the MMSU–AREC is one among the 21 of its kind throughout the country. ARESs are tasked to formulate rural energy plans; install NRES demonstration units; conduct related trainings, seminars and workshops; monitor NRES installations; and perform other functions as may be coordinated by DOE. Through the years, the AREC at MMSU has established a record of reliability as partner of DOE in the development and promotion of NRES in northern Luzon. In the same vein, MMSU–AREC expanded its partnership with industry and other potential partners to enhance and facilitate its functions in research development, promotion and
commercialization (RDPC) of RES consisting of photovoltaics, biogas, cook stoves, and micro-hydro systems.

Photovoltaic technology involves the “harvesting” of energy from the sun. The harvested energy is transformed into usable electricity for various household purposes. The technology uses the state-of-the-art process of collecting the energy from the sun through solar panels made up of silicon cells. From the panels, the solar energy is stored in dry cell batteries from which suitable equipment are connected. The solar panels are designed and installed either as a solar home system (SHS) for each individual household or through a battery-charging station where the solar panels are installed in a central location where a number of household users charge their storage batteries. MMSU-ANEC is directly involved in the promotion of this technology through the DOE Barangay Electrification Program (BEP) especially in remote off-grid areas.

A biogas technology consists of generating useful gas from animal wastes. The gas is in the form of methane, the same gas that people buy called liquefied petroleum gas (LPG) used for various household and even commercial purposes for heating and lighting. This gas was introduced recently as a desirable fuel for motor vehicles. Biogas technology is promoted more widely by MMSU-AREC in piggery farms where there is abundant hog waste.

The improvement of cook stoves is another area of involvement of MMSU-ANEC. Under this project is the continuing development, testing and commercialization of cook stoves with enhanced heating efficiency.

In the search of established practices in the area of RDPC of RES particularly with respect to the management of the interface with industry, this paper offers a piece of a relevant and established but evolving experience.

Objectives

This paper aims to document and share the experience of MMSU–AREC in managing RDPC interface with industry with respect to RES. The disclosure of the experience covers the entire 20 years of existence of the Center.
METHODOLOGY

Locale

The primary setting of this case covers the home-base of the AREC at MMSU in Batac City and the province of Ilocos Norte. Included as study sites are the identified service areas of the Center namely the provinces of Ilocos Sur in Region 1 and Abra located in the Cordillera Administrative Region (CAR) and other areas where services were extended. Table 1 presents the study areas in each province where RES are being implemented.

Design and Unit of Analysis

This is a case study aimed at capturing the phenomenon of interest – the partnership management system within the MMSU–AREC. The investigation into the processes and the consequences/outputs except for the impacts are framed in a one-group cross-sectional design. The impacts of the Barangay Electrification Project (BEP) project were analyzed using the combination of randomized comparison group and post-facto before-and-after designs.

Collection of Data

Data were obtained primarily from secondary sources consisting mostly of Center reports in various forms, i.e., monitoring reports, progress and status reports, annual reports, and impact reports. Information was also gathered through interviews with the past project staff, partners and beneficiaries. The impact data on the BEP were obtained from the AREC study conducted for the purpose.

Analysis of Data

Most of the data were analyzed descriptively using measures of central tendency including percentages and frequencies where they were found applicable. After generating the first draft of the report, each project staff was furnished with a copy for their individual review and critiquing. After sometime, they were convened into a conference to deliberate on their respective reviews. Consensus was obtained as to how the individual views were consolidated and incorporated to form this final document.
Table 1. The geographical locations of the RES implemented by the MMSU–AREC.

<table>
<thead>
<tr>
<th>Type of RES</th>
<th>Location</th>
<th>Municipality by Province/City</th>
<th>Barangay</th>
<th>No. of units/beneficiaries*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Abra</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumping system</td>
<td>Pilar</td>
<td>1/1 Mun hall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting system</td>
<td>Pidigan</td>
<td>1/1 Mun hall</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dolores</td>
<td>1 + 1 clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ilocos Norte</td>
<td>Poblacion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adams</td>
<td>1/25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nueva Era</td>
<td>Barangubong</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ilocos Sur</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cervantes</td>
<td>Dinwede East</td>
<td>2/27; 1 brgy hall; 1 school</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gregorio del Pilar</td>
<td>Alfonso</td>
<td>2/28; 3 brgy halls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pilar</td>
<td>Matue</td>
<td>2/33; 2 brgy halls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quirino</td>
<td>Tubtuba</td>
<td>2/38; 1 brgy hall; 1 coop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Salcedo</td>
<td>Madarang</td>
<td>2/65; 1 brgy hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Emilio</td>
<td>Matibuey</td>
<td>6/23; 3 brgy halls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sugpon</td>
<td>Banga</td>
<td>2/28; 1 brgy hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caoayan</td>
<td>3/13; 1 RHU; 1 church</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Danac</td>
<td>2/34; 1 brgy hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pangotan</td>
<td>2/25; 1 brgy hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Batac City Pasuquin</td>
<td>1/1 community</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tabug</td>
<td>1/1 military station</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laoag City Balintawak</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barit</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Talingaan</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Piddig</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pinili</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solsona</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vintar</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ilocos Norte</td>
<td>Pasuquin</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Magsingal</td>
<td>Patong</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sinait</td>
<td>Macabiag</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paratong</td>
<td>Tapao</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>San Vicente</td>
<td>Sagasat</td>
<td>1/1</td>
</tr>
</tbody>
</table>

Biogas

Batac City Tabug 2/1 farm
Laoag City Balintawak 1/1
Barit 1/1
Talingaan 1/1

Ilocos Norte
Pasuquin Davila 1/1
Piddig Aruay 1/1
Pinili Darat 1/1
Solsona Manolpac 1/1
Vintar Lubnac 1/1

Ilocos Sur
Magsingal Patong 1/1
Sinait Macabiag 1/1
Paratong 2/2
Tapao 1/1

San Vicente Sagasat 1/1
Table 1. Continuation...

<table>
<thead>
<tr>
<th>Type of RES</th>
<th>Location</th>
<th>No. of units/beneficiaries*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Municipality by Province/City</td>
<td>Barangay</td>
</tr>
<tr>
<td>Subtotal</td>
<td>Vigan City</td>
<td>Fatima</td>
</tr>
<tr>
<td>Windmill</td>
<td>2 provinces, 2 cities</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Abra</td>
<td>Tayum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bangued</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Batac City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ilocos Norte</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Currimao</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dingras</td>
</tr>
<tr>
<td>Subtotal</td>
<td>2 provinces, 1 city</td>
<td>5</td>
</tr>
<tr>
<td>Cookstove</td>
<td>Ilocos Norte</td>
<td>137/3 models</td>
</tr>
<tr>
<td></td>
<td>Laoag City</td>
<td>14/2 models</td>
</tr>
<tr>
<td></td>
<td>Ilocos Sur</td>
<td>90/3 models</td>
</tr>
<tr>
<td></td>
<td>La Union</td>
<td>3/1 model</td>
</tr>
<tr>
<td></td>
<td>Pangasinan</td>
<td>13/2 models</td>
</tr>
<tr>
<td></td>
<td>Kalinga</td>
<td>1/1 model</td>
</tr>
<tr>
<td></td>
<td>Nueva Ecija</td>
<td>1/1 model</td>
</tr>
<tr>
<td></td>
<td>Cavite</td>
<td>3/1 model</td>
</tr>
<tr>
<td>Subtotal</td>
<td>6 provinces, 1 city</td>
<td>261/144 individuals</td>
</tr>
<tr>
<td>Multi-fuel multi-crop dryer</td>
<td>Batac City</td>
<td>Tabug</td>
</tr>
</tbody>
</table>

*Refer to households except when specified otherwise

RESULTS

The Management System

The MMSU–AREC–industry partnership management system with respect to RDPC of RES can be captured by way of a conceptual framework. This is called the Renewable Energy Systems Partnership Management (RESPM) Framework (Table 2).

The framework in table form consists of four columns with two main rows, the entries of which are in progression from the general in the first column and row to the particular in the last column and down to the last row. Judging from the contents of the first three basic columns from where the
contents of the rows are derived, the framework is a two-three, eleven management schema. The schema details the nature and operation of partnership management within MMSU–AREC which is deliberate, systematic, and logical. The first column with two rows contains the two fundamentals. The second column in three rows has the three general derivatives. The third indicates the eleven particulars with corresponding management strategy, tactic or activity in the fourth, both contained in the eleven rows in each, respectively. In all, the framework has a total of 27 partnership management concepts and processes. Each process is a “go” or a “no go” decision point in management to form a continuum or a break in the stream of actions.

Table 2. The Renewable Energy Systems Partnership Management (RESPM) framework that encapsulates the MMSU–AREC–Industry partnership arrangement.

<table>
<thead>
<tr>
<th>The two fundamentals</th>
<th>The three general derivatives</th>
<th>The eleven particulars</th>
<th>The management strategies/tactics/activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Having</td>
<td>1. Forming</td>
<td>1. Introspection</td>
<td>Assessing the need</td>
</tr>
<tr>
<td></td>
<td>2. Projection</td>
<td>2. Projection</td>
<td>Assessing the risks and benefits</td>
</tr>
<tr>
<td></td>
<td>4. Selection</td>
<td>4. Selection</td>
<td>Picking the potential partners</td>
</tr>
<tr>
<td></td>
<td>5. Exploration and enlistment</td>
<td>5. Exploration and enlistment</td>
<td>Agreeing on the points of agreement</td>
</tr>
<tr>
<td></td>
<td>6. Formalization</td>
<td>6. Formalization</td>
<td>Inking of MOA/MOU</td>
</tr>
<tr>
<td>2. Keeping</td>
<td>2. Operating</td>
<td>7. Performing</td>
<td>Doing the roles and functions</td>
</tr>
<tr>
<td></td>
<td>3. Sustaining</td>
<td>8. Integrating</td>
<td>Conducting collective activities (meetings, conferences, workshops, planning, coordinating, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Feed backing</td>
<td>Communicating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Recognizing</td>
<td>Reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Amending/Reforming</td>
<td>Rewarding exemplary actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Re-planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amending policies, rules, guidelines, agreement</td>
</tr>
</tbody>
</table>
The Two Fundamentals of Partnership Management

Partnership management in the MMSU–AREC is founded on two management motivations. They are the basic motivations of having partners and of keeping partners.

The Three General Derivatives in Partnership Management

Having pushed by the motivation to “go” for partnership, the next management decision and action is to proceed in three steps. These are the moves of “forming” under the motive of having and “operating”, and “sustaining” under the intention of keeping.

The Eleven Particulars of Partnership Management

Management decision and action proceed from the general derivatives to eleven key management particulars. Corresponding to each of the three general derivatives, there are six management particulars for the act of forming, one for operating, and four for sustaining. The six acts of forming are the sequential moves of introspection, projection, scanning or investigation, selection, exploration and enlistment, and formalization. Under operating is the act of performing. The act of sustaining is composed of four management moves: integrating, feedback, recognizing, and amending or reforming.

The MMSU–AREC Integrated Management Flow to “Having” Partners

The decision to have or not to have partners begins with the management act of introspection. This involves the systematic process of assessing the need of partners. To assess, MMSU–AREC asks and settles two questions: “What is the level of operation that dictates the need?” “What is the status of resources that warrant partnership?” This decision is arrived at thorough position-analysis on the Center with relatively deep assessment of the state of present and future operations particularly with respect to scale, breath and complexity. The decision is generally made collegially as the number of Center staff is relatively small. The production of the documents as basis for the analysis and decision is produced and organized by the different teams. A key product of this assessment is the emergence of the particular areas in operations where partnership would be needed.

Projection comes after a positive decision is arrived at in introspection. From the two starting questions come the questions of risks and benefits to be answered here. MMSU–AREC does a risk and benefit analysis under this stage. A “go” or “no go” decision is arrived at depending on the range and weight.
of the risks and benefits involved and assessed. A “go” decision leads to the next step which is scanning and investigation. This involves preparing a roster of probable partners principally on the “wanting areas” identified in the introspection stage. The list is organized, analyzed, and trimmed down to a manageable number based on probable need and to those that correspond to the need. A background investigation to the down listed prospects follow.

The result of the investigation gives the Center a “go” signal to select and who to pick, initially as potential partners. These potentials are then contacted making the imprimatur for partnership. This stage happens not necessarily only one way with the Center as initiator but could happen in the reverse or mutual. Generally, the reverse and mutual state is easier to manage and is faster to make or arrive at a decision. Which way, when the potential for partnership is recognized by both parties (AREC and potential partner), exploration and enlistment follows. Exploratory talks and negotiations proceed leading to enlistment. The parties commit to ink or formalize the partnership under enlistment. The motivation to have a partner is satisfied when the partnership is formalized usually through the inking of a memorandum of agreement or understanding (MOA/U). The forming aspect of partnership management is completed at this point. Table 3 presents the list of industry partners MMSU–AREC had established.

The MMSU–AREC Integrated Management Flow to “Keeping” Partners

Having partners is one thing and keeping them is entirely another. Although it is part of the continuum under the systematic RESPONSE framework, the continuity is not automatic. To the Center, the keeping is more challenging as it is more complicated than of having. It is the keeping that counts in partnership management. To MMSU–AREC, it is the litmus test of its RESPONSE framework.

Keeping partnership consists of two general management derivatives: operating and sustaining. Operating has one management particular in performing. Sustaining has four management particulars consisting of the acts of integrating, feedbacking, recognizing, and amending and reforming.

Performing calls specifically on the partners to do and deliver their respective commitments, roles and responsibilities prescribed under the forged agreement. This has to be sustained if partnership is to hold through. Thus, sustaining the acts of doing must come sooner than later. To sustain for MMSU–AREC means four things. First come the act of integrating. This is accomplished through three ways: business socializing, complementing and sharing, and co-working. Business socializations are done through regularized
meetings, conferences, and other mutual learning and educational activities. The bond of oneness needed in strong partnerships in the AREC system is built here. Complementing and sharing are indicated by pooling resources together for a common cause. Acting on this principle, partnership within AREC recognizes the “What do you have?” and “What you don’t have?” considerations in such a way to help one another and be strong together for a singular objective. Co-working is doing tasks together beyond the specifics of individual and particular commitments and responsibilities indicated in the MOA or MOU. Many at MMSU–AREC are done this way which provides and added glue to strengthening the bond of partnership.

An indispensable component of sustaining is feed backing. Partners in the AREC circle have built-in regular monitoring and evaluation system with appropriate feed backing mechanism to keep everyone alert and mindful of his/her respective roles and expectations. Feed backing provides a sense of satisfaction and purpose which is necessary to keep the fire of commitment among partners. Here, the role of free-flowing communication and systematized coordination is explored. When this is deliberately pursued, it leads to the act of recognizing exemplary performance which adds fire to the commitment of the partners. Awards, incentives and the likes are mechanisms employed in managing partnership in the MMSU–AREC.

Finally but a precursor to a more vibrant, viable and sustainable partnership is the act of amending or reforming. MMSU–AREC and its partners recognize that perfection is a mere ideal but can be subscribed through endless refinements and improvements of plans and actions. MMSU–AREC and its partners like to be always a step ahead of the present and thus re-planning and amending policies, rules, procedures, guidelines, and practices are parts of its evolving existence. Year in and year out and within are endless but deliberately periodic re-planning, re-doing, re-directing, and the likes are consistent menu in the partnership management operations of MMSU–AREC.
Table 3. The industry partners of MMSU–AREC.

<table>
<thead>
<tr>
<th>Activity/system</th>
<th>Name and address</th>
<th>Type</th>
<th>Role</th>
<th>Inclusive date of effectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Machinen and Technik, Manila</td>
<td>Formal (F)*</td>
<td>Supplier (S) of solar panels, battery control unit (BCU) and inverter</td>
<td>2000-2003</td>
</tr>
<tr>
<td></td>
<td>First Philippines, Manila</td>
<td>-do-</td>
<td>-do-</td>
<td>2001</td>
</tr>
<tr>
<td></td>
<td>Shell Philippines, Manila</td>
<td>-do-</td>
<td>-do-</td>
<td>2002</td>
</tr>
<tr>
<td></td>
<td>Edward Marcos Philippines, Manila</td>
<td>-do-</td>
<td>-do-</td>
<td>2005 to present</td>
</tr>
<tr>
<td></td>
<td>La Union Solar Energy Systems No. 3, La Union</td>
<td>-do-</td>
<td>Supplier and manufacturer (S/M) of BCU and inverter</td>
<td>2007 to present</td>
</tr>
<tr>
<td></td>
<td>Gold Star Lumber and Hardware, Candon City</td>
<td>-do-</td>
<td>Supplier of electrical supplies</td>
<td>2000 to – present</td>
</tr>
<tr>
<td>Total Solar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook Stove</td>
<td>Damilian Group Inc., San Nicolas, Ilocos Norte</td>
<td>F</td>
<td>Adopter, producer and supplier (APS)</td>
<td>2002-2006</td>
</tr>
<tr>
<td></td>
<td>Adelina Villa and Teresita Martinez, San Nicolas, Ilocos Norte</td>
<td>Non-formal (NF)*</td>
<td>-do-</td>
<td>-do-</td>
</tr>
<tr>
<td></td>
<td>Lita Ulep, San Nicolas, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td></td>
<td>Leonardo Amano and Juaning Amano, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>2002 to – present</td>
</tr>
<tr>
<td>Total Cook Stove</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biogas</td>
<td>Motion Hardware Laoag City</td>
<td>F-1; NF-3</td>
<td>Supplier of pipings</td>
<td>2000 to present</td>
</tr>
<tr>
<td></td>
<td>JBCC Hardware Batac City</td>
<td>-do-</td>
<td>Supplier of construction supplies</td>
<td>2000 to present</td>
</tr>
<tr>
<td></td>
<td>Nagabungan Construction and General Services, Pasuquin, Ilocos Norte</td>
<td>-do-</td>
<td>Builder</td>
<td>2004 to – present</td>
</tr>
<tr>
<td></td>
<td>RHEMA Construction, Batac City</td>
<td>-do-</td>
<td>Supplier of construction supplies</td>
<td>2000 to – present</td>
</tr>
<tr>
<td></td>
<td>Benedictines Missionary, Fatima, Vigan City</td>
<td>-do-</td>
<td>Adopter/Demonstrator</td>
<td>1997 to present</td>
</tr>
<tr>
<td>Total Biogas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Table 3. Continuation...**

<table>
<thead>
<tr>
<th>Activity/system</th>
<th>Name and address</th>
<th>Type</th>
<th>Role</th>
<th>Inclusive date of effectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSU Pigger Project, Batac City</td>
<td>-do-</td>
<td></td>
<td>Adopter/Demonstrator</td>
<td>1995 to present</td>
</tr>
<tr>
<td>Victory Rice Mill, Laoag City</td>
<td>NF</td>
<td>-do-</td>
<td>-do-</td>
<td>1999 to present</td>
</tr>
<tr>
<td>Beda's Piggery Farm, Magsingal, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2000 to present</td>
</tr>
<tr>
<td>Romillas Pascual, Vintar, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2001 to present</td>
</tr>
<tr>
<td>Demetrio Yadao, Sinait, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2002 to present</td>
</tr>
<tr>
<td>Francis Nueva</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2002 to present</td>
</tr>
<tr>
<td>Vazken Kerametlian,Magsingal, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Mario Guzman</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Sinait, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Oscar Tolosa, San Vicente, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Lito Ibea, Ilocos Sur</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Antonio de los Santos</td>
<td>-do-</td>
<td></td>
<td>-do-</td>
<td>2003 to present</td>
</tr>
<tr>
<td>Laoag City</td>
<td>-do-</td>
<td></td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Andy Jambaro</td>
<td>-so-</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Solsona, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Alma Ratuita</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Piddig, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Percival Agtina</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2006 to present</td>
</tr>
<tr>
<td>Pasuquin, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2007 to present</td>
</tr>
<tr>
<td>Francisco Suniga</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td>2007 to present</td>
</tr>
<tr>
<td>Vintar, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>Fernando Rondal</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>Pinil, Ilocos Norte</td>
<td>-do-</td>
<td>-do-</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>F-6; NF-15</strong></td>
<td><strong>S-3; B-1; AD-17</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Grand total**    | **34**         | **F-16; NF-18** | **S-11; B/C-1; AD-17; A/D/M/P/S-5** |}

*Formal means with a written agreement in the form of MOA or MOU or other similar hard documents thus, in its absence it is deemed non-formal*
PROJECT OUTPUTS/OUTCOMES AND IMPACTS

This section presents indications of consequences of the RDPC projects of MMSU–AREC which reflect the functionality of the management of the partnership within. These consequences are expressed in terms of outputs representing the immediate end-of-project results and the impacts consisting of the beyond-the-immediate outcomes made up mainly of the assessed level of living of the beneficiaries. Impact assessment was done only, however, on the SHS project.

1. Solar energy system (SES). Through the use of photovoltaic technology and under the Barangay Electrification Project (BEP), AREC have effectively reached-out to provide alternative electricity to areas not yet reached by grid electricity. At the end of year 2008, ANEC have installed a total of 33 SHS and/or BCS in 17 remote barangays located in three provinces (Abra, Ilocos Norte, and Ilocos Sur) and in the city of Batac benefiting a total of 364 households, two municipal halls, one school, 13 barangay halls, one church, one military station, one cooperative building, and one whole community.

2. Biogas system. There are 17 biogas systems that AREC have established to date. These are located in 15 barangays in the two provinces of Ilocos Norte and Ilocos Sur and in the two cities of Laoag and Vigan. Monitors on the performance of the installed systems suggest a fuel and/or electricity cost reduction of P500.00 per month per user-beneficiary. Aside from this is the observed impact on the environment where the biogas system provided an effective means of disposing and recycling animal wastes.

3. Windmill. Five windmill modules have so far been installed by AREC in the provinces of Abra and Ilocos Norte. The promotion of this energy system is rather slow compared to the solar but is a promising one particularly as demonstration modules for the public to become aware of and to appreciate in relation to the commercialization of high-end windmills like the one which have been initiated recently in the municipality of Bangui, Ilocos Norte, considered as first in Asia. However, in contrast to the high-end modules, the AREC modules are designed for water pumping rather than for electricity generation. This implies the suitability of the AREC modules for the agriculture sector especially for irrigation purposes and the pumping of potable water for household and livelihood uses.

4. Improved cook stoves. Striking the heart of fuel wood energy conservation is the AREC project in improving indigenous cook stoves that use traditional fuel like wood and bagasse. Through a series of assessment, design, and re-design processes, AREC came up with three improved
models: the Anagi, Tungko Sae, and Thai bucket cook stoves. The redesigned stoves present a more efficient heating capacity on a per unit of fuel used. So far, AREC have promoted the use of these improved models to seven provinces from Ilocos Norte down to Ilocos Sur, Kalinga, La Union, Pangasinan, Nueva Ecija, and Cavite. This project has caused the commercialization of the three cook stove models, with 261 units already sold to 144 users.

5. Multi-fuel multi-crop drier. This is a special module developed by AREC to showcase an efficient alternative to conventional crop dryers. This is yet a one-module demonstration established at MMSU agri-business project and is proving to be an effective system for the purpose it was designed.

6. Renewable energy resources and systems database management. AREC continued to be a significant partner of DOE in conducting RE resource assessments in the country in order to update data and information that can be utilized by project developers/investors in conceptualizing, designing and evaluating RE projects. MMSU AREC developed a user-friendly and dynamic operational database management decision support system software called Renewable Energy-Map Analysis Program (RE-MAP) to replace the old and outdated version NESCON software. With RE-MAP there is ready-to-update database for a national compilation or atlas showing important RE data elements coupled with spatial context. Through this, researchers, planners and investors can access and share such high quality, accurate and secure operational data and information. Through MMSU–AREC the use of RE-MAP is advocated for institutionalization in various agencies and sectors for swift data sharing and exchange towards the objective of attaining independence and security in energy in the context of sustainable development of domestic as well as global natural resources.

7. Impact on level of living (LOL) and other change attributes. The recent impact assessment study (IAS) on the solar project or BEP shows a significant difference in LOL between the beneficiary and the non-beneficiary with the former at the upper hand. This indicates the positive influence solar electrification has on the level of living among the beneficiaries which impacts on the overall state of living standards in the served communities. The LOL accounts primarily the income and expenditures including the assets of the beneficiaries which were compared with the non-beneficiaries. The IAS, aside from the LOL, also attempted to account for other impacts on the served households, communities, and individuals. The instrument also measured socio-psychological changes particularly in terms of aspirations and alterations in the political and environmental aspects concerning the beneficiaries.
The measures showed significant changes in the beneficiaries compared to the non-beneficiaries which reinforce the socio-economic improvements observed.

CONCLUSIONS AND IMPLICATIONS

Partnership management in the energy sector particularly for RDPC of RES as experienced in MMSU–AREC presents a challenge in the application of conventional management wisdom that is widely and commonly used and applied in other sectors. This experience suggests some refocusing and realignments of traditional concepts and principles as they may be applied to the variants of contexts presented by the RES sector. The experience suggests that partnership management for the energy sector may be more of the genre that evolved in the field of development management rather than the shade espoused in business management and of management of organizations popular in formal systems. As practiced, it shows the significance as well as the direct relevance of the systems framework when rationalized according to the specific stakeholders in the energy sector. This implies the continuing strength of the systems model of thinking as applied to partnership management where all the management functions whether sequential of continuous could be framed to be worked-out for success.

Distinct in the experiences of the case is the deliberate, sequential, and detailed logic of the partnership management or the RESPM framework. The deliberateness is seen in the effort of specifying the multiple components of the system followed. The sequential aspect is manifested by the systematic organization of the components from the fundamentals to the particulars. On the other hand, its logic is conveyed by the consistency of the ordering beginning from the major to the minor components. The three elements taken together signaled as it served to sustain the energy of the partnership. Building and managing strong partnerships between research and industry in the renewable energy sector is tenably workable when made deliberate through a systematic and logical framework like the RESPM in MMSU–AREC.
REFERENCES


Research and Development Management Effectiveness in Agricultural Higher Education Institutions in Western Visayas

Helen U. Navarra

ABSTRACT

The study aimed to determine the level of effectiveness of research and development (R&D) management of the agricultural higher education institutions in Western Visayas for the first semester, Academic Year 2005–2006 using the descriptive-correlational research design with questionnaire as data gathering instrument. The statistical tools used for analyzing the data were the frequency and percentage, mean, standard deviation, and Pearson Product-Moment Coefficient of Correlation. The inferential statistics were set at 0.05 level of significant.

The study revealed the following findings: (1) the R&D management coordinator – respondents are mostly married, female, doctoral degree holder, with longer number in years in higher education institutions (HEIs), and in R&D management; (2) the R&D management capabilities when taken as a whole were assessed as “capable.” The respondents as a whole group assessed the number of personnel involved and educational attainment of personnel as “highly capable,” Department of Budget (DBM) allocation as “capable,” other sources of budget as “not capable” while the floor area of office space, number of computers, and transportation facilities were rated as “capable”; (3) the level of effectiveness of R&D management when taken as a whole group was perceived as “ineffective.” The respondents as a whole accepted that the number of researches published, number of completed R&D projects not yet reported and published, number of researches presented to fora, number of R&D proposals endorsed by DBM and other agencies for funding, and number of awards presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City

Chair, General Education Department, College of Hospitality and Rural Resource Management, Aklan State University, Ibajay, Aklan
received by the personnel involved as “ineffective”; (4) there was a significant relationship existed between R&D personnel capability and R&D management; (5) There was no significant relationship perceived between R&D financial and R&D management; and (6) a significant relationship was discovered between R&D physical facilities capability and R&D management.

Based on the findings, the following conclusions are drawn: (1) the agricultural higher education institutions in Western Visayas are “capable” in their R&D management; (2) the level of effectiveness of R&D management is “ineffective”; (3) the significant relationship found in R&D personnel capability and R&D management suggested that when R&D personnel are capable, R&D management is effective. Therefore, the null hypothesis is rejected; (4) the no significant relationship perceived between R&D financial capability and R&D management denotes that the most important resource in an organization is the human resource. Therefore, the null hypothesis is accepted; and (5) a significant relationship discovered between R&D physical facilities capability and R&D management justifies that when the higher education institution is capable of physical facilities, R&D management is effective. Thus, the null hypothesis is rejected.

Based on the findings and conclusions, the following are recommended: (1) the HEIs in Region VI have to increase the level of effectiveness in its R&D management in terms of the number of researches published, number of completed researches, number of research proposals presented to fora, number of research proposals submitted for funding, and the number of awards from research work; (2) the management of R&D in the HEIs Region VI should seriously consider increasing the number of personnel involved in research, sending them for scholarship and training, and providing incentives and recognition for better performance; (3) the R&D management physical facilities such as office space, computers, furniture, supplies, and the likes are vital component for R&D management effectiveness, hence, this recommendation; (4) the welfare of R&D management personnel should be equally attended by the management. They should be given appropriate salary, honorarium, psychic reward, congratulatory letters, notices published in the university newsletter, special prizes for outstanding publications, outstanding teaching, and a
yearly recognition day acknowledging the researchers in the university/college (individuals who have completed their research projects under different categories); (5) hiring of R&D management personnel with high intra-personal and interpersonal skills, creativeness, hardworking, and honest; (6) creation of Committee in seeking new alternative sources of funding in R&D management; (7) to ensure the quality of effective implementation of R&D program, research in impact assessment be conducted to determine the output of the program; and (7) in future researches to be conducted along with this concern, probably, the perspective of the clients should be considered to provide a missing part for a complete picture of the status and performance of R&D management of HEIs in Region VI.

RATIONALE

Higher education system is a key player in the education and integral formation of professionally competent, service-oriented, principled, and productive citizens (Long Term Higher Education Development Plan 2001–2010).

Research as one of the major functions of higher education institutions (HEIs) endeavors to improve agricultural productivity and generate information/solutions to problem confronting the rural poor. Its objective is to develop improved technologies that answer problems related to agricultural and rural development. However, the Commission on Education (EDCOM) reported that the sad state of higher education research is due among others to small government budget allocation for research; inadequate public education, information and campaign on research results; low rate of public investments in research and development (R&D); weak coordination among HEIs; and inadequate or lack of research facilities and library resources, and other logistics to support research.

Along this line, there is a need to evaluate HEIs’ contribution to national R&D efforts. Ordoñez, in his paper presentation during the Asia Pacific Conference on Higher Education, presented his idea to the participants from the different universities of the Philippines that university research must focus on effectiveness issues rather efficiency issues. Thus, he urged everyone to not just do things better but how to do better things. The effectiveness of research is eloquently expressed by Puno:
“Among our state universities and colleges, a good number are in agriculture are in agriculture. The faculty members and are one of the best if not in the Philippine educational system. Many of them are world class academicians. They provide leadership in expertise in international and regional institutions here and abroad. But why has the agricultural sector not so efficient? About 70% of the populations are in agriculture compared to 5% in the West and other developed countries. Yet, Filipinos are not self-sufficient in food in spite of the big agricultural sector while those in developed countries are already exporting agricultural products.”

In view of the findings made by the Commission on Education and mandate of Commission on Higher Education, it is therefore, deemed necessary to find out empirically the capability of the agricultural higher education institutions’ R&D management in terms of personnel, financial and other sources, and physical facilities.

The researcher being the faculty member of an agricultural state university for a long time has observed that there is really a need for the improvement in the management of R&D services in her own institution and so she wanted to find out weather the reasons that were cited by the EDCOM are true or not to all agricultural HEIs in Western Visayas, hence, this study.

Therefore, the conduct of this research is very timely and significant to the following:

CHED Officials. The findings of this research study would be useful to the CHED officials in monitoring and evaluating the performance of programs of higher education institutions as CHED is empowered in looking into the issue of quality control in any HEIs as embodied in the Republic Act 7722.

Board of Trustees/Regent and Key HEIs’ Officials. The data or information that will be generated from this research will certainly enrich their knowledge in the implementation of the Agriculture and Fisheries Modernization Act 1997 (AFMA). From the results of this study, they will be learning related measures to modernize the agriculture sector of the country in order to enhance their profitability, and prepare said sector for the challenges of globalization. They can do this by giving adequate necessary support services and appropriate funds and for other purposes.

Department of Social Welfare and Development (DSWD), Local Government Units’ (LGUs) and Non-Government Organizations’ Officials and Staff. The results of the study may guide them in forgoing stronger linkages
with HEIs in meeting their mission, which is to help the poor as their way of serving the community.

Local Government Officials and Politicians. This research work may also motivate them to transform their values, thus, working towards active participation in community development undertakings. The study may also help the people in the community see the valuable contributions of public agricultural-HEIs’ research program in building a strong republic.

Research Coordinators. The findings of the study may prove to be helpful as these will serve as valid sources of information for the effective implementation of the program. Likewise, the assessment of the effectiveness of R&D management will guide and somehow inspire researchers in performing their duties and responsibilities to insure that they can contribute in making their constituents more productive and self-reliant. Furthermore, they can make adjustments in R&D program identification and implementation that will lead to the effective delivery of research and development services to the communities.

Faculty and Students. The result of the study can serve as the point of reference towards implementing research programs. Participants can expect to know better of the results of this study and they may be able to find out how important are the rules in the implementation of the research programs of the college/university. More so, the results of this study may serve as basis in planning the future research programs and activities.

Researchers. The results of this study will be of great help to future researchers who will be conducting related or similar studies along this line. The finding could provide significant inputs to their studies. Moreover, the findings of this study may serve as basis in evaluating future research programs.

Objectives

This study aimed to determine the level of effectiveness of R&D services management of the agricultural HEIs in Western Visayas for the First Semester, Academic Year 2005–2006.

Specifically, it sought answers to the following questions:

1. What is the profile of R&D coordinators in terms of civil status, gender, highest educational attainment, number of years in HEIs, number of years in research and development management?
2. What is R&D management capabilities of the agricultural HEIs in terms of personnel, financial and other sources and physical facilities capability?

3. What is the level of effectiveness of R&D management in terms of number of researches published, number of completed R&D projects not yet reported and published, number of researches presented to fora, number of R&D proposals endorsed by DBM and other agencies for funding, and number of awards received?

4. Is there a relationship between R&D personnel capability and R&D management? If there is a relationship, is it significant?

5. Is there a relationship between R&D financial capability and R&D management? If there is a relationship, is it significant?

6. Is there a relationship between R&D physical facilities capability and R&D management? If there is a relationship, is it significant?

**METHODOLOGY**

**Research Design**

The research design used in this study was the descriptive-correlational research design. The appropriateness of this design is based on the main purpose of the study which is to determine the effectiveness of R&D management in higher institutions in Western Visayas.

Respondents of the study

The subjects of the study were R&D management coordinators from the agricultural HEIs Western Visayas. The CHED statistical bulletin provided the total number of R&D coordinators based on the total number of agricultural HEIs. Since the number of R&D coordinators was small, the researcher decided to take them all as respondents of the study.

Table 1 shows the distribution of R&D management coordinators – respondents from agricultural HEIs in Western Visayas.
Table 1. Distribution of respondents from the Agricultural Higher Education Institutions (HEIs) in Western Visayas.

<table>
<thead>
<tr>
<th>Agricultural HEIs</th>
<th>Research and development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Aklan</td>
<td></td>
</tr>
<tr>
<td>Aklan State University (ASU) (Banga)</td>
<td>1</td>
</tr>
<tr>
<td>Antique</td>
<td></td>
</tr>
<tr>
<td>Polytechnic State College of Antique (PSCA) (Hamtic)</td>
<td>1</td>
</tr>
<tr>
<td>Capiz</td>
<td></td>
</tr>
<tr>
<td>Capiz State University (CAPSU) (Burias, Pontevedra, Tapaz, and Dumarao)</td>
<td>4</td>
</tr>
<tr>
<td>Filamer Christian College (FCC)</td>
<td>1</td>
</tr>
<tr>
<td>Iloilo</td>
<td></td>
</tr>
<tr>
<td>Iloilo State College of Fisheries (ISCOF) (Dingle &amp; San Enrique)</td>
<td>2</td>
</tr>
<tr>
<td>Northern Iloilo Polytechnic State College (NIPSC) (Batad &amp; Barotac Viejo)</td>
<td>2</td>
</tr>
<tr>
<td>Central Philippine University (CPU) (Iloilo City)</td>
<td>1</td>
</tr>
<tr>
<td>West Visayas College of Science &amp; Technology (WVCST) (Leon)</td>
<td>2</td>
</tr>
<tr>
<td>West Visayas State University (WVSU) (Lambunao and Calinog)</td>
<td>2</td>
</tr>
<tr>
<td>Negros</td>
<td></td>
</tr>
<tr>
<td>Negros State College of Agriculture (NSCA) (Kabankalan &amp; Sipalay)</td>
<td>2</td>
</tr>
<tr>
<td>Northern Negros State College of Science &amp; Technology (NONSCST) (Sagay)</td>
<td>1</td>
</tr>
<tr>
<td>La Carlota City Colleges (LCCC) (La Carlota City)</td>
<td>1</td>
</tr>
<tr>
<td>University of Negros Occidental Recoletos (UNO-R) (Bacolod City)</td>
<td>1</td>
</tr>
<tr>
<td>Central Philippine Adventist College (CPAC) (Murcia)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
</tr>
</tbody>
</table>
Data Gathering Procedures

The instrument used in gathering the data was a researcher-constructed questionnaire. A questionnaire is described as a form prepared and distributed to assure responses. As a general rule, these questions are factual and intended to obtain information about the conditions or practices of which the respondent is considered to have knowledge.

The questionnaire was divided into two parts: Part I solicited personal information from the respondents. These are the following: name (optional); civil status: (a) single or (b) married; gender: (a) male or (b) female; educational attainment: (a) baccalaureate degree, (b) baccalaureate degree with master's units, (c) master's degree, (d) master's degree with Ph.D./Ed.D units, or (e) Ph.D./Ed.D holder; number of years in HEIs; and number of years in R&D management program.

Part II was the main questionnaire, divided into two areas: Area A, on Research and Development Management Capability, and Area B, on Effectiveness of Research and Development Management. Area A focused on three dimensions: personnel, financial, and physical facilities capability. Personnel capability has two items: number of personnel involved and educational attainment. Financial capability has two items: DBM budget allocation and other sources of budget. Physical facilities capability has three items: floor area of office space, number of computers, and transportation facilities.

The respondents were requested to answer the item in the questionnaire by checking the column corresponding to their response, which are: “highly capable,” “capable,” and “not capable.” These responses were given a weight of 3, 2, and 1, respectively.

The computed mean was converted into a description using a measuring instrument devised by the researcher based on Guilford’s Frequency Distribution Table. The scale of means was obtained by subtracting the lowest weight, which is one from the highest weight, which is three. The range or difference is two, divided by the number of categories, which is three. The quotient is 0.66, which became the step interval used to come up with the class interval shown below.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.34-3.00</td>
<td>Highly capable</td>
<td>The statement conveys that the college/university is highly capable/commendable to implement.</td>
</tr>
<tr>
<td>1.67-2.33</td>
<td>Capable</td>
<td>The statement conveys that the college/university is capable to achieve the intended outcomes of R&amp;D but improvements should be made to overcome deficiencies.</td>
</tr>
<tr>
<td>1.00-1.66</td>
<td>Not capable</td>
<td>The idea conveys that the college/university is not capable to implement. Significant improvements are required to make the college/university at least to be capably recognized.</td>
</tr>
</tbody>
</table>

Area B on the Level of Effectiveness of Research and Development Management, the researcher-made questionnaire was constructed based on the 2004 Revised Accrediting Agency of Chartered Colleges and Universities in the Philippines, Inc. (AACCUP) Survey Instrument in formulating questions. The performance indicators of R&D were taken from the Philippine Association of State Universities and Colleges (PASUC) SUCs Leveling Questionnaire CY 1998-2002. There are five performance indicators on R&D: number of researches published; number of completed R&D projects not yet reported and published; number of researches presented to fora; number of R&D proposal endorsed by DBM and other agencies for funding; and number of awards received by R&D personnel within the five calendar years (2000–2004). The respondents were requested to answer the item in the questionnaire by checking the column corresponding to their response as to how effective was their college/university in R&D management considering the five performance indicators.

Their responses were “very effective,” “effective,” “fairly effective,” “ineffective,” and “very ineffective.” These responses were given a descriptive value of 5, 4, 3, 2, and 1, respectively.

The researcher utilized the Likert scale in interpreting the computed means on the level of effectiveness of R&D management.

The scale of means was obtained by subtracting the lowest weight, which is one from the highest weight, which are five. The range or difference is four, divided by the number of categories, which are three. The quotient is 0.79, which became the step interval used to come up with the class interval shown below.
<table>
<thead>
<tr>
<th>Question Response</th>
<th>Mean Scale</th>
<th>Description</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.20–5.00</td>
<td>Very effective</td>
<td>The idea/statement conveys that the college/university has 9 or more researches published, completed not yet reported and published, presented to fora, proposals endorsed by DBM and other funding agencies and 9 or more awards received by R&amp;D personnel within a period of five calendar years (2000–2004).</td>
</tr>
<tr>
<td>4</td>
<td>3.40–4.19</td>
<td>Effective</td>
<td>The idea/statement conveys that the college/university has 5–8 researches published, completed not yet reported and published, presented to fora, proposals endorsed by DBM and other funding agencies and 5–8 awards received by R&amp;D personnel within 5 calendar years (2000–2004).</td>
</tr>
<tr>
<td>3</td>
<td>2.60–3.39</td>
<td>Fairly effective</td>
<td>The idea/statement conveys that the college/university has 3–4 researches published, completed not yet reported and published, presented to fora, proposals endorsed by DBM and other funding agencies and 3–4 awards received by R&amp;D personnel within a period of 5 calendar years (2000–2004).</td>
</tr>
<tr>
<td>2</td>
<td>1.80–2.59</td>
<td>Ineffective</td>
<td>The idea/statement conveys that the college/university has 1–2 researches published, completed not yet reported and published, presented to fora, proposals endorsed by DBM and other funding agencies and 1–2 awards received by R&amp;D personnel within 5 calendar years (2000–2004).</td>
</tr>
<tr>
<td>1</td>
<td>1.00–1.79</td>
<td>Very ineffective</td>
<td>The idea/statement conveys that the college/university has no researches published, completed not yet reported and published, presented to fora, proposals endorsed by DBM and other funding agencies and no awards received by R&amp;D personnel within 5 calendar years (2000–2004).</td>
</tr>
</tbody>
</table>
Content Validity of Questionnaire

The validity of the instruments used on research is very important; the conclusions by the researchers are based on the information they obtained using these instruments. According to Fraenkel and Wallen, validity refers to the appropriateness, meaningfulness, and usefulness of the inference a researcher makes. Thus, content-related evidence of validity refers to the content and format of the instrument. The content and format must be consistent with the definition of the variable and the sample of subjects to be measured.

The researcher-constructed questionnaires were submitted to the researcher’s adviser for corrections and suggestions for improvement of the instrument. The questionnaires were presented to the jury of experts for content validation using the Eight-Point Criteria for Content Validation by Good and Scates. When the questionnaires were returned, the researcher included all the suggestions of the Panel of Experts for there were items that were added, other items were modified, and were restated. All corrections and suggestions were integrated in the final draft of the questionnaires.

Reliability of the Questionnaire

After the questionnaires were found valid, the final draft was reproduced for reliability testing. Thirty (30) faculty members involved in research and development program of the three campuses of Aklan State University (Ibajay, Kalibo and New Washington) were requested to answer the questionnaires. The split-half method was used to determine the reliability coefficient of the instrument. According to Garrett, the split-half method was regarded as the best method of measuring test reliability, its main advantage being that all data for computing reliability can be obtained upon one occasion. In this method the responses on the odd-numbered items were correlated with the responses to the even-numbered items.

The formula used to determine the reliability coefficient of one-half of the questionnaire was Spearman rank-difference formula shown below.

\[ \rho = 1 - \frac{6 \Sigma D^2}{N(N^2-1)} \]

Where:

- \( \rho \) = coefficient of correlation from rank difference
- \( \Sigma D^2 \) = sum of squares of the differences in rank
- \( N \) = number of pair scores or measure.
The Spearman-Brown Prophecy formula shown below was used to determine the reliability coefficient for the whole questionnaire.

\[ r_{11} = \frac{2r_{\frac{1}{2} \cdot 11}}{1 + r_{\frac{1}{2} \cdot 11}} \]

Where:

- \( r_{11} \) = reliability coefficient of the whole questionnaire
- \( r_{\frac{1}{2} \cdot 11} \) = reliability coefficient of the questionnaire found experimentally.

When the reliability coefficient of the whole questionnaire was computed it was found out that the reliability coefficient of the whole questionnaire on R&D management was 0.86. According to Smith, if the reliability coefficient of the whole questionnaire is 0.80 or higher but not more than one, the questionnaire is reliable.

After the validity and reliability of the questionnaire were established, the researcher secured the approval to administer the questionnaire from the presidents/school administrators/deans of the twenty-one agricultural higher education institutions in Western Visayas. The questionnaire was reproduced according to the total number or respondents.

The researcher personally administered the questionnaires to the respondents in twenty-one agricultural higher education institutions. To get 100% retrieval of the questionnaires, the researcher waited the return of the accomplished questionnaires on the same day the questionnaires were distributed. After the retrieval of the accomplished questionnaires, the data were tabulated, organized, and processed using the Statistical Package for Social Sciences Software (SPSS).

**Statistical Tools Used**

The following are the statistical tools used in the analysis and interpretation of data:

*Frequency and Percentage.* These were used to determine the profile of the respondents in terms of gender, civil status, educational attainment, number of years in higher education institution, number of years in R&D management; effectiveness of R&D management in terms of number of researches published, number of completed R&D projects not yet reported and published, number of R&D proposal endorsed by DBM for funding, and number of awards received by the personnel.
Mean. The mean was used to determine the general description of the capability and effectiveness of R&D management in agricultural HEIs. Guilford stated that the mean is considered the most reliable or accurate of all the measures of central tendency values because it fluctuates less widely than the mode or median.

The formula is shown below:

\[ M = \frac{\sum X}{N} \]

Where:
\( M \) = the mean of the score
\( \Sigma \) = sigma (sum of)
\( X \) = the sum of scores
\( N \) = number of respondents.

Standard Deviation. The standard deviation serves as an indicator of the amount of heterogeneity and homogeneity of the data gathered. The formula for computing the standard deviation is shown below:

\[ SD = \sqrt{\frac{\sum X^2}{N}} \]

Where:
\( SD \) = standard deviation
\( \Sigma \) = sigma (sum of)
\( X \) = the value of each item
\( N \) = the number of the measure in score.

Pearson Product-Moment Coefficient Correlation (Pearson r). The Pearson Product-Moment Coefficient Correlation or Pearson r at 0.05 alpha level of significance was used to determine the relationships among R&D management capability variables namely: personnel, financial and other sources of funding, and physical facilities; and the effectiveness of R&D services management. The Pearson r formula is shown below.

\[ r_{xy} = \frac{\sum x'y'}{N} - M x'My' \]

Where:
\( r_{xy} \) = the sum of the product deviations from the assumed mean of x and y
\( N \) = number of cases
\( Mx' \) = mean coded value for \( x' \)
\( My' \) = mean coded value for \( y' \)
$o_x^1 \quad = \quad \text{standard deviation for coded value of } x^1$

$o_y^1 \quad = \quad \text{standard deviation for coded value } y^1.$

**DISCUSSION/INTERPRETATION**

**The Profile of Research and Development Management Coordinators When Taken as a Whole Group**

Research and development management coordinator respondents were classified according to categories of variables such as civil status, gender, educational attainment, number of years in higher education institutions, and number of years in research and development management.

When classified according to civil status, six or 29% were single and fifteen or 71% married. When classified according to gender, five or 24% were male and sixteen or 76% female. When classified according to educational attainment, one or 5% had baccalaureate degree, three or 14% baccalaureate degree with master’s units, four or 19% master’s degree, two or 10% master’s degree with PhD/EdD units, and eleven or 52% PhD/EdD degree. When classified according to number of years in agricultural HEIs, ten or 48% had shorter number of years in agricultural HEIs, that is, ten years and below, while eleven or 52% had longer number of years in agricultural HEIs that is above ten years in agricultural HEIs. This classification of the respondents having longer years in agricultural HEIs if they have been ten years in service in higher education institutions and shorter if otherwise is based on Daleon and Sanchez’s classification.

When classified according to the variable number of years in R&D management, three or 14% had 1–3 years, seven or 33% had 4–6 years, and eleven or 53% had seven years and above. This classification of respondents was done by taking the mean of the whole data using below and above the mean considering that coordinatorship/chairmanship in R&D is given only two years and extended if otherwise depending on the will of the school head.

**Research and Development Management Capabilities of Agricultural Higher Education Institutions**

The results showed that R&D in terms of personnel capability of the agricultural HEIs was “highly capable” specifically in terms of the number of personnel involved and education attainment of personnel.

Research and development management capabilities of agricultural higher education institutions when taken as a whole group was found to be
“capable.” This could be interpreted that presidents/school administrators have tried their best to make their colleges/universities capable of achieving the intended outcomes of R&D management.

Specifically, R&D of the agricultural HEIs in terms of personnel capability was higher particularly in the number of personnel involved and in the educational attainment of the personnel.

As to their financial capability, the agricultural HEIs were “capable” in accordance to the DBM budget allotted for research activities and “not capable” in other sources of budget; in terms of physical facilities capability, the agricultural HEIs were “capable” in the floor area of R&D office, number of computers used in research and number of transportation facilities.

However, it was noted that there is a need to improve R&D management capabilities especially in the financial and physical facilities. This may imply that effectiveness in R&D management will be affected if the president/school administrator will continue to ignore the said inadequacies. According to CHED Executive Director William C. Medrano in his speech delivered during the 12th PASSAGE (Philippine Association of Agri-environment Educators/Entrepreneurs) Biennial Conference conducted at UP Los Baños, Laguna, last October 18–20, 2005, the decline in research in agriculture and fishery is attributed to poor R&D budget, poor research facilities, and low research culture in most of the state universities and colleges (SUCs). The statement of the CHED Executive Director is justified by the works of De la Peña when he reported that MOOE components of the SUCs budget have been decreased over the past years. The same author predicted that government fiscal deficit problems will linger until 2009. On this context, De la Peña urged the SUCs to increasingly seek new and alternative source of funding support and a new basis for that support. He further suggested that the entire government budgeting system be reformed to become performance-based and output-oriented.

Level of Effectiveness of Research and Development Management of Agricultural Higher Education Institutions When Taken as a Whole Group

The result showed that R&D management program of the HEIs was “ineffective” in terms of the number of researches published, number of completed research and development projects not yet reported and published, number of researches presented to fora, number of R&D proposals endorsed by DBM and other agencies for funding, and number of awards received by the personnel involved. The overall mean was 1.83, which means that generally R&D management of the HEIs was “ineffective.”
The data computed revealed that R&D management of agricultural higher education institutions as perceived by the respondents were ineffective. It is assumed that R&D output is still at minimal level despite high capability of personnel as validated by the result of the study. In addition, low priority given by higher education institutions to R&D might also be the reason for the ineffectiveness of R&D management.

Looking at the financial capability of the agricultural higher education institutions, the data revealed that financial resources were found almost not capable. In this sense, the researcher hypothesized that most agricultural HEIs have same budgetary problems in the implementation of their R&D management programs.

Along this line, the statements made by Elevazo, Pangilinan, Bernardo, De Leon and Medrano are attestations of the sad plight on R&D management programs in agricultural higher education institutions.

Since one index of excellence in higher education is the quality and quantity of research generated by a well-trained and productive faculty, R&D management programs should be provided with support in terms of manpower, funding, and infrastructure.

The importance of providing resources to R&D is also attested by Librero when he reported that according to Pardey, et al, Malaysia provided the highest funding support to research, while the Philippines provided the least funding support. In view of the report that Malaysia is providing the highest funding support to research, Razak revealed that research leadership is given an important priority in the University of Sains Malaysia, to further facilitate the central mission of generating and disseminating new knowledge, which is essential to the survival of the university. Librero further revealed that according to Ratnam, a professor of University Sains Malaysia, universities have had to go beyond their traditional teaching functions and become established as research institutions in their own right because most of the money that is needed for research comes from outside sources.

As De la Peña reported MOOE components of the SUCs budget have been decreased over the past years. He also predicted that governments’ fiscal deficit problems will linger until 2009. It is in this context, De la Peña urged the SUCs to increasingly seek new and alternative sources of funding.

Based on the ideas of Medrano and others, as well as the reports made by De la Peña and Librero, funding came out as the most important resource in order to have an effective R&D management. However, Martirez insisted that people power is the most significant and potent factor of all the
resources available to an organization and that an organization may start with zero funding, but with creative, resourceful, hardworking, and honest people.

The assertion of Martirez is well supported by the concept of quality management. Quality management according to John, is a management approach of an organization centered on quality based on the participation of all its members and aiming at benefit to all members of the organization and society. Schlander mentions that Total Quality Management (TQM) ensures judicious use of resources; it creates an atmosphere where the management and employees work hand in hand; it focuses on the development of employees’ potential; it produces customer satisfaction; it provides the process of continued improvement; and develops the potential in people. Domingo suggested that to ensure higher success in implementing total quality management, quality mission statement, quality leadership, quality policies, quality training, quality improvement, quality behavior, and quality attitude must be taken into consideration.

Likewise, Collins affirmed that quality management emphasizes the crucial role of management in the quality process and utilizes a combination of methods, theories, techniques, and quality strategies in achieving quality and it becomes everyone’s responsibility in the organization.

To improve therefore, the level of effectiveness in R&D management, the researcher suggests that concept on quality management be known to R&D management coordinators and most of all to the presidents/school administrators of agricultural HEIs.

**Relationship Between Research and Development Management Personnel Capability and Research and Development Management**

A significant relationship existed between R&D personnel capability and R&D management; null hypothesis is rejected, which means that when R&D personnel are capable then R&D management is effective.

The results of the study are in agreement with the statement of De la Peña when he made his conclusion during the 2005 PASUC (Philippine Association of State Universities and Colleges) Assembly that the pursuit of the SUCs research agenda is more likely to be limited by the lack of sufficient human resources rather than financial resources. In the same manner, Edralin disclosed that it is difficult for universities to conduct extensive research or devote time and effort in serious research when a large portion of their faculty only holds bachelor’s degree.
In view of the finding, the researcher realized that SUCs have to attract adequate numbers of creative, well-trained, and adaptable Filipinos who choose to undertake research careers in their institutions to ensure that they are in a position to make the best use of their talents.

**Relationship Between Research and Development Financial Capability and Research and Development Management**

No significant relationship existed between the financial capability and research and development management in the agricultural HEIs, therefore the null hypothesis is accepted.

The data imply that financial resource is not as important as the human resource. The significance of human resources in organization has been pointed out by Drucker as cited by Martinez, that the only resource, which can have an output greater than the sum of its parts is the human resource. Moreover, an organization may start with zero funding, but with creative, resourceful, hardworking, and honest people, it becomes financially viable. On the other hand, a plethora of financial and material sources in organization may go down the drain if handed by an incompetent and dishonest staff.

However, the significance of funding could be verified by the statement of Bernardo when he affirmed that in an environment where financial support for research is scarce and sporadic, one could not expect that many researchers will be able to design extended research programs to meaningfully address a particular problem. Instead, what one could expect at best would be research efforts heavily constrained by limitations on time and finances. Furthermore, De Leon reported that lack of funds to finance research is one of the common problems hampering the dissemination of technologies. In addition, Bevazo and Elevazo cited that the lack of funds was the reason why research functions of SUCs have been relatively neglected; hence schools cannot undertake research projects and published research results.

With consideration to the significance of funding to R&D management program, the researcher suggests that financial capability should also be considered in looking into the effectiveness of R&D management.

**Relationship Between Research and Development Physical Facilities Capability and Research and Development Management**

A significant relationship existed in the physical facilities capability and the rural development management, therefore the null hypothesis is rejected.
which means that when the HEIs R&D physical facilities are capable, R&D management is effective.

CONCLUSIONS, POLICY IMPLICATIONS, AND RECOMMENDATIONS

Based on the findings, the following conclusions, policy implications, and recommendation are drawn:

1. The management of R&D in agricultural HEIs is “ineffective.” This implies that agricultural HEIs in Region VI are encouraged to increase the level of effectiveness in its R&D management in terms of the number of researches published, number of completed researches, number of research proposals presented to fora, number of research proposals submitted for funding, and number of awards from research work.

2. The significant relationship found in R&D personnel capability and R&D management suggested that when R&D personnel are capable, R&D management is effective. Thus, increasing/hiring of R&D personnel with high intra-personal and interpersonal skills, creative, hardworking, and honest is highly recommended. Likewise the welfare R&D personnel should be equally attended by the management. They should be given appropriate salary, honorarium, scholarship/training, psychic reward-congratulatory letters, notices published in the university newsletter, special prizes for outstanding publications, outstanding teaching, and a yearly recognition day acknowledging the researchers in the university/college.

3. The no significant relationship that existed between R&D financial capability and R&D management denotes that the most important resource in an organization is human resource (Drucker). research and development management therefore, has to step up the level of financing resourcing capability through linking and partnership efforts with other research agencies and other institutions doing research or planning to do research works.

4. A significant relationship that existed between R&D physical facilities capability and R&D management justifies the assumption that when the higher education institution capable of physical facilities, R&D management is effective. Hence, office space, computer, furniture, and supplies should be adequate and improved since they are vital components of R&D management.
5. To ensure the quality of effective implementation of R&D management programs, research on impact assessment be conducted to determine the output of the program.

6. For future research to be conducted along this concern, probably, the perspective of the clients should be considered to provide a missing part for a complete picture of the status of the performance of R&D management of HEIs in Region VI.
Assessment of the Research Culture
Among Private HEIs in a Region:
Basis for Developing a Primer

Joy DP. Talens

ABSTRACT

This study was aimed to assess the extent to which the various components of research culture namely, leadership competence of research leader; management skills of the research leader; research capability of faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages have been manifested among selected private Higher Education Institutions (HEIs) in CALABARZON Region. Using the descriptive instructional method of research, this study specifically used the Provus Evaluation Model in its approach to assessment of the major variables concerned. Employing the stratified purposive proportional sampling technique, this study involved a total of 349 respondents drawn proportionally from the six private participating HEI’s top management, middle management, faculty and graduate students enrolled during the first semester of School Year 2008 – 2009. Data and other information needed in this study were gathered mainly through questionnaires, informal interviews, observations, documentary analysis and the use of triangulation of data.

Results of the study revealed that based on the perceptions of the four groups of respondents, the various components of research culture have been found to have been “observed to a great extent” among the six participating HEI’s in CALABARZON Region with leadership competence of the research leader as the first in rank followed by the management skills of the research leader; incentive, opportunities and reward system; space and facilities; research capability of faculty; networking and linkages; and funding. However, in consideration of the Total Quality Assurance (TQA), it was found out that gap existed between the mean perception of the respondents and the intent of TQA in all the seven components of research culture. Moreover, a “very high significant
relationship” has been found to have existed between and among the various components of research culture.

In consideration of the findings of this study, a primer has been developed to serve as a tool and guide to management of participating private HEI’s in their quest to continuously improve their research culture and attain total quality assurance.

This study recommends among all others the need to enhance the research culture among the private HEI’s in CALABARZON Region and the use of the Primer developed for such a purpose. Furthermore, a yearly assessment of the research program, a replication of this study perhaps, in government run HEI’s, a conduct of comparative study of research capabilities between private and public institutions of higher learning and further validation of the developed Primer, may also be taken into consideration in future research endeavors.

THE PROBLEM AND ITS BACKGROUND

Introduction

In any organization, management is vital, without which, nothing would be achieved. Management involves the process of planning, organizing, staffing, controlling, budgeting and problem-solving. People in the organization count on it for the attainment of the desired outcomes. However, for management to achieve its goals and meet the organization’s vision, the cooperation of everyone in the organization is as vital, too. Thus, it is necessary for the managers to handle with utmost care financial and human resources to execute plans, implement and deliver the goods and services. Managers should realize that management involves people in the planning and implementation process to achieve the desired results.

To face and meet the challenges of today’s competitive world, managers must be equipped with necessary skills, more particularly, conceptual, human and technical skills. Conceptual skills refer to the ability of the manager to see the big picture to attain the goal of the organization while human skill deals with the ability to relate well and good with people through proper communication and interaction. On the other hand, technical skills are all about the manager’s techniques and approaches to achieve organizational goals.

In dealing with people, managers should always bear in mind that in an organization, not all people are satisfied with how they handle their
financial and human resources. The need for people motivation and recognition is highly imperative particularly to those whose abilities have not been discovered and harnessed and therefore, may be experiencing low morale which may make them unproductive. Moreover, the need for managers to provide people with greater opportunities for advancement must also be recognized along with a program of rewards and recognition for good performance. This really poses a great challenge for the managers. If this will be given attention, everybody will move forward towards what the organization is heading for.

In managing an organization, leaders always emerged. They are the ones who set the vision for the organization. If managers focus on maintaining systems and process, leaders influence people to follow. Maxwell (1998) opined that the best way to test whether a person can lead rather than manage is to ask him or her to create positive change. Managers can maintain direction, but they cannot change it. To move people in a new direction, one needs influence. But the bottom line for followers is what a leader is capable of. Leaders should possess certain competencies. Competencies are about the skills and characteristics that people bring to tasks and situations and what they do that results in successful outcomes (Trotter and Ellison, 1997).

Like any organizations, schools need to be managed and led. To say that the school is effective, management and leadership are very important. Bush and Bell (2003) pointed out that:

“The effective management of education is increasingly regarded as a vital element in school and college improvement and in raising educational standards in many parts of the world. Management is the overarching concept within which leadership is subsumed. Effective schools require good leadership and good management.”

School leaders in the college or university setting are tasked to focus on the threefold function of Higher Education Institutions (HEIs) such as instruction, community service and research.

As society becomes more knowledge intensive, it becomes more and more dependent to social institutions like colleges and universities that create knowledge educate people and provide them with varied learning resources. Indeed, the new role of today’s colleges and universities emerged in a new world wherein knowledge, creativity and innovation play an ever increasing pressure in generating and sustaining growth. Realizing the vital role played by institutions of higher learning, colleges and universities must not to lose sight of the intrinsic goals of being devoted to higher learning
and to the advancement of knowledge that will lead to personal improvement and greater economic gain.

With this scenario, there is a compelling need for HBs to go beyond the traditional teaching functions and effectively respond to the demands of change. It is expected to perform a trifocal function namely, instruction, research and service to community. As emphasized in the Preamble of the World Declaration on Higher Education for the Twenty-First Century: Vision and Action, one of the missions and functions of higher education institutions is to advance, create and disseminate knowledge through research and provide, as part of its service to the community, relevant expertise to assist societies in cultural, social and economic development, promoting and developing scientific and technological research as well as research in the social sciences, the humanities and creative arts.

To survive the global competition, HBs are expected to help the nation to become a country with functionally literate, well-educated population with specialists in advanced science and technology who will become knowledge providers. Therefore, educational institutions should focus on building up an intellectual and learning society and in the creation of a new body of knowledge and advancement that would help the country’s economic and social development. This is the main reason why HBs continuously allot resources to enhance their research capability. In addition, research has increasingly been the indicator of excellence of any university (Villa, 2007). To cite an example, the European Higher Education Area and the European Research Area recognize the importance of research as an integral part of higher education across Europe. European ministers emphasize the importance of research and research training and the promotion of interdisciplinarity in maintaining and improving the quality of higher education and in enhancing the competitiveness of European Higher Education more generally.

This modern concept of HEI's poses a great challenge to purely teaching institutions. Truly, the transformation costs a lot on the part of the administration (Gonzales, 2004). In the same way, institutions of higher learning should be very willing to embark on this endeavor to keep abreast to the needs of the time by incorporating research into the very fabric of the organization; nearly every operation within the institution is impacted in some way or another by the conduct and support of research (Kulakowski and Chronister, 2006). Moreover, institutions worldwide realize that for the organization to be successful in this undertaking there is a great need to develop research culture among the school leaders and managers, faculty and students which stimulates, promotes, assists and rewards those faculty members who take on the burdens of seeking and operating sponsored
projects. Furthermore, fostering research culture often means recognizing the continuum from basic to applied research and acknowledging that while some individuals pursue their own research agenda in a solitary fashion, others depend more on team efforts.

Research culture according to Hill (1999) can be defined as “a pattern of basic assumptions about research — invented, discovered, or developed by a given group as it learns to cope with the external and internal problems of research— that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think and feel in relation to research problems”. It therefore reflects the values, ideals, and beliefs about research within the organization. These in turn are reflected in the research behaviors, research actions, and research symbols of the organization.

Within the HEIs’ environment, leaders, managers, faculty, schools and research centers are expected to maintain a vibrant research culture. This particular responsibility is backed up by a number of legal mandates and other provisions.

Article XIV, Section 11 of the 1987 Constitution of the Republic of the Philippines states that:

“The Congress may provide incentives including tax deductions to encourage private participation in programs of basic and applied research. Scholarships, grant-in-aids, or other forms of incentives shall be provided to deserving science teachers, researchers, scientists, inventors, technologists and specially gifted citizens”.

In addition, Article XIV, Section 18 of the 1987 Constitution of the Republic of the Philippines states that the State shall encourage and support researches and studies on the arts and culture.

Section 23 of Chapter 2 entitled Declaration of Basic State Policy and Objectives of the Education Act of 1982 states that one of the objectives of Tertiary Education in the Philippines is to advance knowledge through research works and apply new knowledge for improving the quality of human life and responding effectively to changing societal needs and conditions.

With the recommendation concerning the status of Higher-Education Teaching Personnel approved by the General Conference of UNESCO in November 1997 and the Research Program of the Commission on Higher Education (CHED,1997), it is but necessary to strengthen research culture in an institution. Institutions of higher learning do not have any choice but to align the vision – mission – goal – objectives to these important aspects of the
academic life. Research culture must be cultivated among school leaders, managers, faculty and students to become attuned to the current trend in education.

Defensor (2008) emphasized that to achieve the institution’s goal of enhancing research culture, activities should be geared towards the reinforcement of the following foundations of a research culture: trained faculty or researchers with master and doctorate degrees, funding, facilities and library resources and linkages whether local or international.

With the things aforecited, it is worthy to note that with the aim of enhancing research culture varied strategies should be formulated and implemented like what foreign universities are doing. In doing so, there is a necessity for competent leaders and committed managers to attain this goal. School leaders need to make sure that the budget is in order, that the right people are hired for jobs, that the needs of clients, citizens, or in this case, students, are met. They provide the direction, leadership, and day-to-day management of an institution’s educational activities (Kulakowski and Chronister, 2006).

School leaders through their unwavering leadership and management, are the right persons to take the lead in achieving an enhanced research culture. Most institutions have centralized the leadership and management of research in a central office of research led by a Chief Research Officer, Vice President or Vice Chancellor for Research, Research Directors and Deans who belong to the top management. But it is not only the Research Director who must fulfill the task but the Deans of the different colleges as well. The chairs should cherish and must buy into the new mission with the same level of zeal as the President, Vice President for Academics and Research Director. The chairs and unit heads are considered as research administrators who belong to the middle management.

Being one of the faculty members who actively engaged in research activities for several years and have realized that creation of knowledge through research is fundamental to life in the academe, thus assuming the position of Research Director of the Research and Development Office of Sacred Heart College, Lucena City, the researcher endeavored to conduct a research to find out the extent of manifestation of the various research components such as leadership competence and management skills of the research leader; research capability of faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages and recommend ways to enhance the research culture among HEIs in CALABARZON (Cavite, Laguna, Batangas, Rizal and Quezon provinces). The findings of the study hopefully would serve as bases of the development of a
primer to enhance research culture. The researcher considered these institutions in the CALABARZON area because experiences of their administrators, teachers and researchers and their established research culture are commendable. With the present status of research in CALABARZON having thirty HEIs actively involved in research and twenty with research units, and the fact that CALABARZON ranks second to National Capital Region in terms of research (Inlayo, 2008), the researcher strongly believes that the findings of this study could further contribute in enhancing research culture not only in her institution but also among the HEIs within the region. The output of the study which is the primer can be the basis for other HEIs in the country to improve their own.

With this study, the researcher is very optimistic that research will be given equal priority with instruction and community service. With the identification of the strengths and weaknesses in the various components of research culture, Higher Education Institutions in CALABARZON can enhance their school’s research culture.

Research Locale

This study was conducted in CALABARZON of the Philippines. CALABARZON region is the result of the splitting of Southern Tagalog Region into two. The split formed Region 4 A CALABARZON and Region 4 B MIMAROPA which were created in 2002. Region 4 A is composed of five adjacent yet diverse provinces which are grouped together to integrate social and economic development of the area. The five provinces are: Cavite, Laguna, Batangas, Rizal and Quezon. The region’s name is an acronym of the names of these provinces.

CALABARZON is located in the southwestern Luzon, just south and west of Metro Manila and is the second most densely populated region. The region’s accessibility to Metro Manila is the favored day tour destination of many city–weary weekenders from the busy metropolis.

The province of Cavite is bordered to the north by the city of Manila and is directly across the bay from the province of Bataan. To the east, one will find the province of Rizal and Laguna and to the south Batangas, with the west border being the South China Sea.

Located at the center of CALABARZON Region is the province of Laguna which is bordered by Rizal to the north, Quezon to the south the Sierra Madre Mountains to the east and to the west by Batangas and Cavite.
Batangas is bordered to the west by the South China Sea and to the south by the Verde Passage which separates Luzon from the island of Mindoro. To the east are the provinces of Quezon and Laguna and to the north are Cavite and Laguna.

Another province in Region 4 A is Rizal province which is bordered to the north by Bulacan and to the south by Laguna de Bay. It is the nearest eastern neighbor to Manila and to the west lie the provinces of Laguna and Quezon.

Being a huge province, Quezon has borders to the north with Aurora and Camarines Sur to the south. To the west is Aurora, Batangas, Bulacan, Laguna, Nueva Ecija and Rizal and to the west with Camarines Norte and Camarines Sur.

CALABARZON, being the growth area of southern part of the Philippines in terms of industrial resources, socio-economic importance and tourism potentials, depends on its more than two hundred (200) Higher Education Institutions for providing functionally literate and well-educated population with specialists in advanced science and technology. Colleges and universities in the region build and enhance intellectual and learning society and in the creation of new knowledge that are necessary for economic and social development. This is the reason why HEIs in the region make every effort to focus on research as one of the trifocal functions of colleges and universities considering the present status of research in CALABARZON where there are thirty (30) HEIs actively involved in research and twenty with research units.

Among the HEIs in CALABARZON, six of them were chosen as the research locale of the present study. Figure 1 shows the map of the higher education institutions in Region 4 A – CALABARZON. All of them offer bachelor and masters’ degrees and more importantly, they have research programs which are the main focus of this study. These institutions are also the founders of organization and or network that are very much engage in the conduct of research as the CALABARZON Research Council (CRC), the research arm of the Commission on Higher Education Department (CHED) and the Network of CALABARZON Educational Institutions (NOCEI). Because they offer graduate programs, the Philippine Association for Graduate Education Region 4 A – CALABARZON Chapter (PAGE 4 A) prosper through the leadership of the six HEIs involved in this study.

One of the institutions which is very active in the conduct of research in the region is the Adventist University of the Philippines formerly Philippine Union College is a Christian boarding school located at Puting Kahoy, Silang,
Cavite, Philippines established 1917. It is a private institution of higher learning affiliated with the Seventh-day Adventist Church. As of this date, the university holds an autonomous status recognized by the Commission on Higher Education.

De La Salle University – Dasmarinas, Dasmarinas, Cavite was established on July 18, 1977 as a private non-sectarian tertiary school named General Emilio Aguinaldo College – Cavite and managed by the Yaman Lahi Foundation. In 1987, ownership and management were transferred to the Frere Benilde Romancon Educational Foundation, Incorporated, a sister corporation of De La Salle University – Manila. This private institution of higher learning was granted Level III reaccreditation from the Federation of Accrediting Association of the Philippines and the Philippine Accrediting Association of School, Colleges and Universities.

Another La Sallian institution is located in Lipa City which is De La Salle – Lipa which was established in 1962. In 1996, the school opened its graduate programs.

Formerly known as Luzonian Colleges, the Manuel S. Enverga University Foundation was established on February 11, 1947. It is private institution of higher learning in Lucena City accredited by the Philippine Association of Colleges and Universities Commission on Accreditation.

The University of Batangas was originally founded as Western Philippine Colleges on April 28, 1946. This private institution located in Batangas City is accredited by the Philippine Association of Colleges and Universities Commission on Accreditation.

Located along the old National Highway in Binan, Laguna, the University of Perpetual Help System, Laguna is a private non-sectarian institution. It is formerly known as Perpetual Help College of Laguna which was established in 1976. It is accredited by the Philippine Association of Colleges and Universities Commission on Accreditation.

All of the HEIs mentioned are accredited by various accrediting agencies and their leaders are very active in research organizations such as CALABARZON Research Council (CRC); Network of CALABARZON Educational Institutions (NOCEI); and the Philippine Association for Graduate Education (PAGE).
Theoretical Perspectives

This study was anchored on the World Declaration on Higher Education for the 21st Century, more particularly, Section C Article V which clearly stipulates the need for higher education institutions to enhance research in all disciplines and to give importance to the enhancement of HEIs research capacities. For one thing, the World Declaration stresses the fact that the advancement of knowledge through research is an essential function of all systems of higher education and, therefore, these HEIs should ensure that all members of the academic community are engaged in research and must be provided with appropriate training, resources and support.

The necessity to strengthen research culture in an institution was emphasized among the recommendations advanced by the General Conference of UNESCO (1997) regarding the status of Higher Education Teaching Personnel. Accordingly, institutions of higher learning do not have any choice but to align their vision, mission, goals and objectives to the various important aspects of academic life and that research culture must be cultivated among HBIs’ school leaders, faculty and students to become attuned to the current trends in education.

The framework for Priority Action for Change and Developments of Higher Education, (UNESCO, 2008) makes it clear that priority actions at national level including governments, parliaments and other decision makers should in particular:

1. Reinforce the links between higher education and research

2. Make efforts, when necessary, to establish close links between higher education and research institutions, taking into account the fact that education and research are two closely related elements in the establishment of knowledge; and

3. Develop innovative schemes of collaboration between institutions of higher education and different sectors of society to ensure that higher education and research program effectively contribute to local, regional and national development.

In addition, the policies and standards of the Commission on Higher Education in various programs have specific provisions on research such as:

1. “A master's thesis is generally required for all master's programs while a dissertation is required for all doctoral programs”. (CMO # 36 s. 1998);
2. Strengthening research advocacy in higher education through the Philippine Association of Graduate Education (PAGE) – National Higher Education Research Agenda related activity (CMO # 21, s. 1999);

3. In the teacher education program which stresses the conduct of research among the faculty which states that faculty members actively engaged in relevant and significant research as work in teacher education shall be afforded special privileges and benefits such as reduced teaching and or its equivalent (CMO # 30, s. 2004);

4. Similar provisions are provided in other tertiary level programs such as:
   - Business Administration (CMO # 39, s. 2006);
   - Medical Technology (CMO # 14, s. 2006);
   - Nursing Education – Nursing Law which provides for the research requirement for both students and faculty which states that undertaking nursing and health manpower development training and research is required in all colleges of nursing; and

5. For colleges aspiring to be converted into university status, its strong research capability is one of the major requirements (CMO # 48, s. 1996)."

Based on the Commission on Higher Education (CHED) Research Program,

“The college must maintain a dynamic and continually growing research program that promotes supports and sustains a positive research culture among faculty, students and administrators. All research activities are managed through the Research and Development Center of the College headed by the Research Director. This is to ensure the capacity of the institution to carry out systematic and significant researches.

In the National Higher Education Research Agenda (NHERA) of the Commission on Higher Education, the following have been given as the goals of research in higher education:

1. Push the frontiers of knowledge across all the identified higher education disciplines in the country;

2. Enhance instruction through original contributions in specialized disciplines thereby encouraging students to become creative, innovative and productive individuals;
3. Develop unifying theories or models which can be translated into mature technologies for the purpose of improving the quality of life of the Filipinos within the sphere of influence of the academic institutions in the country.

Defensor (2008) said that the academe, being the logical repository of scholars and graduate students in the making, is expected to take the lead in developing and nurturing a “research culture” among our people. Universities are expected to produce the skilled professionals who will compete in the international labor market and produce competitive products and services as much as form part of the innovation system that generate or provides information and data needed in formulating and implementing national programs for sustainable development. In turn, the country benefits from new knowledge and technologies for improving productivity and quality of life as well.

Universities are also expected to produce researchers and scientists who will do research and extension.

For HEI’s to be able to produce good researcher and produce credible research outputs (through faculty or institutional research undertakings), it must have the following elements or inputs: to enhance research culture: enough numbers of faculty with appropriate educational background; sufficient funding; facilities and library resources; and linkages, both local and international.

While there are some institutions with adequate resources to do research and extension, like HEIs with Centers of Excellence and Centers of Development, we need much more to enable us to keep pace with our fast developing neighbors. Data show that of the more than 113,000 faculty in our 1,800 HEIs, only 9.2% completed their doctorates with 31% earning a masters degree. It is timely to note that a significant percentage of the graduate degree holders majored in non-research oriented programs. In Region IV – A, 8% of the faculty are PhD holders and 33.5% have masterate degrees. HEIs nurture researchers generally through the graduate programs. About 466 HEIs in the country offer graduate programs with around 40% or 180 schools offering the PhD program. Though graduate education in the Philippines is growing, it is only in limited areas of specialization – specifically education and arts, business and commerce. Very few HEIs in native grounds offer PhD programs in science and engineering are at par with standards of universities abroad.
Some consider funding as the most important ingredient of a research culture, but few HEIs allocate institutional funds for research. Experience shows that an institution with good researchers who are adept at preparing research proposals on priorities identified by local and foreign donor agencies could access, or more precisely, compete for funds from such sources. CHED Research Management Information System data show that some of our good universities get about 20% of their total research funds from external sources.

The third element, which is facilities and library resources, leaves much to be desired. Interventions to establish or develop state of the art facilities and library resources to support research and scientific undertakings have not been adequate. Up to now our HEIs especially in the provinces have outdated library collections and poorly equipped or maintained laboratories.

As to the fourth element, which is linkages, over the years research has become a highly resource intensive activity. Given the limited resources of most individual HEIs, networking and linkages are a must, as are collaborations through joint research, information sharing, facilities sharing and the like. HEIs are aware of the importance of linkages and may have aggressively been entering into Memorandum of Understanding or Agreement among themselves and with other Research and Development Institutions, let alone with industry, professional associations, or with sister institutions abroad.

Based on the CHED National Higher Education Research Agenda, the Commission’s thrusts of quality and excellence, access and equity, relevance and responsiveness and efficiency and effectiveness are seen to result in the generation of technology directed, innovative/creative, locally responsive, and globally competitive research.

All of these theories are related to the present study because they explained research culture and the various components to enhance it among Higher Education Institutions (HEIs) that the more enhanced the research culture is the better the university as what Villa (2007) stated that research has increasingly been the indicator of excellence of any university. These will be the basis for developing a primer.

Research culture among HEIs is found at the center. Surrounding outside the main concept are the seven identified components such as leadership competence of the research leader; management skills of the research leader; research capability of faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages.
The indicators of the leadership competence of the research leader are: the leader takes the initiative to learn and grow; and stay current with the world of sponsors, regulations technology, legislative and other influences of the research agenda; the ability to demonstrate high level of honesty, integrity, ethics in solving problem and answering ambiguous questions, weighs risk versus reward and finds innovative solutions to new problem; takes pride of and highlights the accomplishments and achievements of its research faculty and staff; fosters innovation, culture and environment that allow faculty to flourish; supports research commensurate with the national and international standards of excellence; and sees to it that nearly every operation within the institution impacted in one way or another by the conduct and support of research.

The management skills of the research leader are indicated by the skills to practice networking among and between schools, departments, Research Institutes or Research Centers; makes sure the budget allotment is in order and adequate; hires the right people for the jobs to augment the demands of the institution’s research strategy; meets the needs of teachers in the conduct of research; implements regulations and policy set by the government, sponsors and institutions; generates funds or grants for research; and handles the process of project or research proposal, submission and oversight of research business and research and scholarship.

In terms of research capability of faculty, the following are its indicators: the number of trained faculty with doctorate and master degrees is adequate; the number of faculty who are members if relevant subject panels and professional organizations actively involved in the conduct of research is adequate; the faculty establish a good track record based on previous researches conducted and published in local and international refereed journals; the faculty members have established a long tradition of exploring their own interests and pursuing their own research agenda; the faculty members are trained in research pedagogy to serve as research advisors; the faculty members manifested research – oriented attitudes; and the faculty members are aware of research funding, project management, knowledge transfer and commercialization.

The indicators of funding as one of the components of research culture are: institutional budget for research is allotted; funds for research infrastructure and funding for library supporting research is provided; funds for faculty and staff development such as attendance to seminars, workshops, conferences and fora and fieldwork to both staff and researchers are adequate and on transparent basis; funds for postgraduate researchers and post doctorate fellowships are appropriated; the institution avails funds for research from the Commission on Higher Education Department (CHED).
Fund for Assistance to Private Education (FAPE), government agencies such as Department of Science and Technology, Department of Energy, Department of Health, etc.; city and provincial government; international agencies such as UNICEF, World Bank, Asian Development Bank, etc; other agencies of Japan, Norway, United Kingdom, Australia, Canada, etc.

Space and facilities are indicated by the following: Research Institutes or Research Centers headed by a Research Director with the necessary staff and facilities are set up; the institutes or centers are integrated within over – all academic and administrative structure; the institution invests in state of the art research facilities like internet, statistical software and equipment; the institution maintains a Research Database, archiving individual research achievements, including grants, contracts and publications (research journals, newsletters, etc); and the institution sets a routine three – year cycle for IT equipment and replenishment.

The indicators for incentives, opportunities and reward system are: the institution gives monetary (cash incentives, honorarium) and non – monetary (promotion, certificates, workload credits) to outstanding faculty members who were chosen to present a research paper to conferences locally and internationally; the institution has provision for faculty deloading and leaves (sabbatical leave) to have enough time to conduct research; opportunities among faculty to attend and present papers in conferences and fora both local and international covering travel and incident expenses are provided; and incentives are provided for productive research performance through merit pay system, adequate faculty salaries and workload credits.

Networking and linkages have the following indicators such as: research network is developed and sustained through external research collaboration with private companies, government institutions and other universities; consortium arrangements are entered with institutions that have established records; partnerships with key government agencies in its locality in the conduct of research projects to testify its commitment in achieving its vision as a center of research relevant to the region are established; consultancy for government and industry research is provided; and interfaculty collaboration among different colleges is conducted.

The identified components indicate that research culture prevails among HEIs. These components are related to one another as represented by broken lines that if one will not be given attention or ignored research culture will not be enhanced and or sustained. Therefore, in order to enhance research culture, all of these variables should be given priorities by the school leaders.
The researcher took cognizant of these components as variables of the study. They are the bases for constructing more efficient and effective research agenda.

Statement of the Problem

This research study aimed to assess the extent of the manifestation of the various research components among HEIs in CALABARZON.

Specifically, it sought to answer the following questions:

1. What is the extent of manifestation of the following components of research culture as perceived by the top management, middle management, faculty and graduate students:
   - leadership competence of the research leader;
   - management skills of the research leader;
   - research capability of faculty;
   - funding;
   - space and facilities;
   - incentives, reward system and opportunities; and
   - networking and linkages?

   What are the strengths and weaknesses of each component?

2. Are there significant relationships between and among the extent of manifestation of the various components of research culture as perceived by the:
   - top management;
   - middle management;
   - faculty; and
   - graduate students?

3. Based on the findings, what primer can be developed to enhance research culture among HEIs in CALABARZON?

Hypothesis

The researcher forwarded the following hypothesis: there are no significant relationships existing between and among the extent of manifestation of the various components of research culture as perceived by the:
• top management;
• middle management;
• faculty; and
• graduate students.

Significance of the Study

It is of prime importance for any institution that offers higher education to gather information on the extent of manifestation of the various research components to enhance research culture among HEIs.

The owners of higher education institutions will benefit from results of the present study. The institutions can strengthen their research culture emphasizing the different components to enhance research culture such as leadership competence of the research leader; management skills of the research leader; research capability of faculty; funding; space and facilities; incentives, reward system and opportunities; and networking and linkages. If the institution imbibes to a great extent a research culture, this is a great edge on their part to increase enrollees because research is an indicator of quality teaching. Their curricular offerings and major policies or decisions are very relevant because these are based on the conduct of scientific investigations.

From the results of the study, the President would be enlightened on his or her role as a leader on the trifocal functions of higher education that of instruction, community service and research. With this conviction, the President will realize that his or her mere presence and incorporating in his or her messages the importance of research, the whole school organization will be mobilize to attain the status of a research oriented school. This will help in the promotion of the institution knowing that excellence in research is an indicator of a high performing Higher Education Institution.

The research leaders such as Vice President for Research, Chief Research officer and Research Director and Deans will be benefited in such a way that their leadership competence and management skills will be enhanced so they can implement the research program successfully. They can also be guided by the output of the study so that they can facilitate knowledge generation and exchange. School leaders will be enlightened in terms of best strategies to revitalize the faculty to engage themselves in research, generate funds, acquire facilities and library resources and establish linkages.

College deans will be benefited from the results of the study through affirming their role as leaders and managers in their respective departments.
Their role will be revitalized in such a way that the results of the researches to be conducted will be incorporated in instruction resulting to improvement. On the other hand, teachers under their supervision will discover that through the policies in the conduct of research implemented by the dean, teaching performance will be enhance, thus enabling them to grow professionally.

The members of the faculty in various colleges will be benefit from the results of the proposed study in such a way that they will be encourage to engage themselves in trainings, seminars and workshops that will help them grow professionally. They can discover that academic life is not purely inside the four corners of the classroom. They can benefit also from the facilities, library resources and linkages that will be improved by the different strategies to enhance research culture.

The staff of the institution will also benefit from the results of the study through exposure to research which can be their gauged to further improve themselves professionally and offer them opportunities to explore or venture to another career.

Because of the possible improvement in the quality of teaching through the conduct of research, students of the higher education institutions will experience learning in an environment, provided with well-evaluated instructional materials and tested pedagogy by research oriented faculty. Students will not be left behind in terms of current trends in the education system. Another benefit of the students is the acquisition of first hand experience of learning through research based curricula that will help them to become lifelong learners.

Scope and Delimitation of the Study

The study was conducted to assess the extent of manifestation of the various components of research culture such as leadership competence and management skills of the research leader; research capability of the faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages. The findings and results became the bases for the development of a primer on the topic. Four (4) groups such as the top management, middle management, faculty and graduate students were the participants of the study from the private universities of the provinces of Cavite, Laguna, Batangas and Quezon. These universities are active members of the CALABARZON Research Council (CRC), the research arm of the Commission on Higher Education in the region; founding members of the Network of CALABARZON Educational Institutions (NOCEI) and the Philippine Association for Graduate Education (PAGE).
These are the Vice Presidents or Vice Chancellors, Deans, Chairs, Department Heads or Unit Heads, College faculty and graduate students.

The study was conducted during the period from April to January, 2009.

**RESEARCH DESIGN AND PROCEDURE**

This chapter describes the methods employed in conducting the study, the respondents of the survey, the data gathering instruments used, the procedures followed and how the results of the research activity were analyzed and interpreted.

**Research Design**

The descriptive instructional development method with application of the Probus Discrepancy Evaluation Model was used in this study. The principal aim in employing this method is to assess the extent of manifestation of the different research components. Descriptive research according to Best (1970) as cited by Cohen, et al (2007) is concerned with conditions or relationships that exist; practices that prevail; beliefs, point of views, or attitudes that are held; processes that are going on; effects that are being felt; or trends that are developing. It is concerned with how what is or what exists is related to some preceding event that has influenced or affected a present condition or event.

**Participants of the Study**

The participants of this study included a representative sample drawn from four major occupational groups namely: 1) top management, composed of Vice Presidents or Vice Chancellors and Deans; 2) middle management, composed of Department or Unit Heads and Chairs; 3) faculty members teaching in the various colleges; and 4) graduate students enrolled during the First Semester of S.Y. 2008 – 2009. All of them are stakeholders of the six private universities in CALABARZON. Table 1 shows the distribution of participants of the present study. See Appendix G for the list of institutions.
Table 1. Distribution of participants of the study.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Top Management</th>
<th>Middle Management</th>
<th>Faculty</th>
<th>Graduate Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institution 1</td>
<td>10</td>
<td>9</td>
<td>23</td>
<td>22</td>
<td>64</td>
</tr>
<tr>
<td>Institution 2</td>
<td>8</td>
<td>12</td>
<td>22</td>
<td>20</td>
<td>62</td>
</tr>
<tr>
<td>Institution 3</td>
<td>7</td>
<td>8</td>
<td>21</td>
<td>22</td>
<td>58</td>
</tr>
<tr>
<td>Institution 4</td>
<td>8</td>
<td>8</td>
<td>20</td>
<td>20</td>
<td>56</td>
</tr>
<tr>
<td>Institution 5</td>
<td>7</td>
<td>8</td>
<td>20</td>
<td>20</td>
<td>55</td>
</tr>
<tr>
<td>Institution 6</td>
<td>8</td>
<td>7</td>
<td>19</td>
<td>20</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>52</strong></td>
<td><strong>125</strong></td>
<td><strong>124</strong></td>
<td><strong>349</strong></td>
</tr>
</tbody>
</table>

Sampling Procedures

The sample of respondents included in this study was determined by employing stratified proportional sampling.

The strata were selected using the purposive sampling technique. Purposive or deliberate sampling, as used in this study involved asking a particular occupational group in the university based on their availability at the time of the conduct of the study, to share their impression on the extent by which components enhance research culture. It is sampling with a purpose. According to Ball (1990) as cited by Cohen, et. al (2007), purposive sampling is used in order to access “knowledgeable people”, those who have in-depth knowledge about particular issues by virtue of their professional role, power, access to networks, expertise or experience.

The six HEIs are situated in the different provinces in CALABARZON, thus, it took time for the researcher to make an appointment with the person in charge of the distribution of the questionnaires and to make follow ups of the approval of the request to conduct the study. It also took several months for the retrieval of the instrument. Observation and documentary analysis were done every time the researcher visited the universities. The informal interview was done every break time on the occasion of the two-day seminar and forum of the CALABARZON Research Council with the approval and assistance of the officers of the said organization of faculty researchers.

The selection of sample respondents for each occupational group within the strata varies. All strata (position) are represented in the sample and the sample members are selected from each stratum at random. In allocating the sample size among the strata, the method used in this study is proportional allocation whereby each stratum is contributed to the sample number that is proportion to its size in the population. The allocation of strata
members in the sample is proportional to the number of members in the strata of the population. Since there are four different occupational categories, this means that there are four strata. Thus, the actual sample size among strata is indicated in Table 2.

### Table 2. Strata Distribution of Sample

<table>
<thead>
<tr>
<th>Strata</th>
<th>Strata Size</th>
<th>Sample Size To Strata (%)</th>
<th>Invited Sample</th>
<th>Accepted Sample</th>
<th>Data producing Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management</td>
<td>68</td>
<td>80</td>
<td>54</td>
<td>54</td>
<td>48</td>
</tr>
<tr>
<td>Middle management</td>
<td>79</td>
<td>80</td>
<td>65</td>
<td>65</td>
<td>52</td>
</tr>
<tr>
<td>Faculty</td>
<td>610</td>
<td>30</td>
<td>183</td>
<td>183</td>
<td>125</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>720</td>
<td>20</td>
<td>144</td>
<td>144</td>
<td>124</td>
</tr>
<tr>
<td>Total</td>
<td>1,477</td>
<td>100</td>
<td>446</td>
<td>446</td>
<td>349</td>
</tr>
</tbody>
</table>

According to Fox (1976), invited sample is defined as all elements of the population to which an invitation to participate in the research is extended. Accepting sample is that portion of the invited sample that accepts the invitation and agrees to participate while data producing sample is that portion of the accepting sample that provided data.

### Data Gathering Instrument

In order to gather the data and information needed in this study, the following data collection instruments and methodologies were employed:

- **Questionnaire.** Householder and Boser (2006) emphasize the importance of obtaining an accurate assessment on the effectiveness of change effort and innovation, which to them demands for the necessary development and verifications of a set of measures that could used to assess the effectiveness of the program. Thus, the development of the assessment instrument on the extent by which various components enhance research provided the key indicators that measure the strengths and weaknesses of the program. For this particular study, an assessment survey questionnaire in the form of a checklist which consisted of identified key indicators developed by the researcher and validated by educational experts was administered to four occupational groups from the six private HEIs with research program in CALABARZON namely: Adventist University of the Philippines, Silang, Cavite; De La Salle University – Dasmarias, Dasmarias, Cavite; De La Salle – Lipa, Lipa City; Manuel S.
Enverga University Foundation, Lucena City; University of Batangas, Batangas City; and University of Perpetual Help System, Binan, Laguna.

- **Informal Interview.** Kerlinger (1970) as cited by Cohen, et.al (2007) pointed out that interview is used to follow up unexpected results or to validate other methods or to go deeper into the motivations of respondents and their reasons for responding as they do. Thus, informal interview was conducted during the Seminar - Workshop and Research Forum sponsored by the CALABARZON Research Council (CRC), the research arm of the Commission on Higher Education (CHED) IV – A last October 23 – 24, 2008 at the Fonte Pino Hotel, Batangas City. Vice Presidents, Deans, Chairs, Unit Heads, faculty and graduate students attended this activity. The researcher grabbed this opportunity to conduct the informal interview because she was not allowed to personally distribute the questionnaires to the respondents. On the other hand, the researcher was given the permission by the president of the council to interview the attendees who were first asked if they had answered the questionnaires. In the process, the researcher jotted down the respondents’ comments/opinions. This was undertaken as a means of enriching the information obtained from the accomplishment of the assessment survey.

- **Observation.** Cohen, et.al (2007) explained that the distinctive feature of observation as a research process is that it offers an investigator the opportunity to gather “live” data from naturally occurring situations. In addition, researcher can look directly at what is taking place in situ rather than relying on second - hand accounts. Thus, observations of actual practices on how research was being done in the universities were undertaken. The researcher was invited in the research colloquia in the universities and visited the offices of the Research Directors. The researcher also has established contacts and connections with them.

- **Documentary Analysis.** Bailey (1994) as cited by Cohen, et.al (2007) noted that through documentary analysis, documents are made useful in rendering more visible the phenomena under study. It shows how situations have evolved over time. Thus, documentary analysis was conducted by the researcher through the examination of documents like publications which includes research journals and newsletters; brochures; pamphlets; development plans; timetables; technical documents such as contracts and memorandum of agreement. Once the researcher visited the institution, she requested the respective Research Director to allow her to examine their documents. The directors were very willing to share because they are active members of the CALABARZON Research Council.
that aims to help other HEIs to have their own culture in the conduct of research. This was conducted to verify the results of the study.

- **Triangulation.** Cohen, et.al (2007) defined triangulation as the use of two or more methods of data collection in the study of some aspect of human behavior. It attempts to map out, or explain more fully, the richness and complexity of human behavior by studying it from more than one standpoint and by making use of both quantitative and qualitative data. It is a powerful way of demonstrating concurrent validity, particularly in qualitative research. It bridges issues of reliability and validity. Thus, the researcher interviewed some of the participants, cited their responses and got their pronouncements and literature was cited to validate the responses.

**Description of the Instrument**

The assessment instrument used in this study to assess the extent of manifestation of the various research components among HEI’s in the CALABARZON Region, was developed by the researcher. Presented in the form of checklist, the instrument, using the five – point Likert scale is composed of 57 items representing the seven research components. Respondents were requested to rate each item from a scale of 1 – 5 where “5” is the highest and “1” is the lowest. The first part of the instrument provides for the instructions to respondents on how the instrument should be filled up. (Appendix B presents the Assessment Instrument on the Extent of Manifestation of the Various Research Components among HEIs in a Region).

**Procedures Undertaken in the Development of the Assessment Instrument**

**A. Construction of the Questionnaire**

1. **Developing the First Draft and Establishing the Validity of the Assessment Instrument**

The first stage in the development of the assessment instrument was the construction of the questionnaires. The researcher consulted various literatures to come up with the contents of the instrument in particular the research components and their indicators. Based on the provisions of the World Declaration on Higher Education for the Twenty – First Century: Vision and Action; Commission on Higher Education Department’s (CHED) Research Program; National Higher Education Research Agenda (NHERA); provisions in the 1987 Constitution of the Republic of the Philippines; Education Act of 1982; policies and standards of the Commission on Higher Education in
various programs that have specific provisions on research, pronouncements of various authors; studies conducted; and practices observed by different institutions, it was identified that there were seven research components. These are leadership competence of the research leader; management skills of the research leader; research capability of the faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages. Indicators for each of the seven components were also identified in the construction of the instrument.

After the construction, the researcher presented the draft to the advisers for comments and suggestions to improve the instrument. It was advised that in order to arrive at a meaningful interpretation of the validation results, the following ranges with corresponding description and interpretation should be used by the experts:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description/Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6 – 3.0</td>
<td>Very applicable</td>
</tr>
<tr>
<td>1.6 – 2.5</td>
<td>Applicable</td>
</tr>
<tr>
<td>1.0 – 1.5</td>
<td>Needs improvement</td>
</tr>
</tbody>
</table>

It was also suggested that information such as name and educational background should not be reflected in the questionnaire. Likewise, items for each research component should be constructed using simple words and there should only be one thought per indicator.

The validation process involved ten education experts who provided substantial improvement on the formulation of the functional definition of the identified research components. Table 3 shows the results of the validation.

Based on the results, space and facilities as a research component was considered very applicable with the other components such as networking and linkages; incentive, opportunities and reward system; research capability of faculty; leadership competence of the research leader; funding; and management skills of the research leader were considered applicable by the validators. The average mean of 2.37 with an interpretation of applicable impelled the researcher to consider all the components in the final construction of the questionnaire.
2. Establishing the Instrument Reliability

The First Trial Run

Prior to the conduct of the first try-out, the first draft of the instrument was presented to the two (2) advisers of the researcher for comments and suggestion for improvement. Suggestions on the rating scale used and the test-retest reliability of the instrument were computed using the Pearson Product Moment Correlation. The computation revealed a reliability coefficient of 0.61. This means that the newly developed instrument has moderately high reliability. The computation of the instrument’s reliability is presented in Appendix E. The final form of the assessment instrument was again presented by the researcher to her advisers for further comments and suggestions for improvement before the conduct of the actual data gathering process.

B. Administration of the Instrument

The instrument was administered personally by the researcher in consideration of the following procedures:

1. presentation of a letter of request to the university authorities concerned
2. acquisition of the university official’s approval of the letter of request allowing the researcher to administer the instrument
3. administration of the instrument questionnaire among the identified respondents
4. collation of the questionnaire.

Table 3. Results of the Experts’ Validation of the Instrument

<table>
<thead>
<tr>
<th>Indicator</th>
<th>X</th>
<th>Rank</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Leadership Competence of the Research Leader</td>
<td>2.32</td>
<td>5th</td>
<td>Applicable</td>
</tr>
<tr>
<td>B. Management Skills of the Research Leader</td>
<td>2.1</td>
<td>7th</td>
<td>Applicable</td>
</tr>
<tr>
<td>C. Research Capability of Faculty</td>
<td>2.36</td>
<td>4th</td>
<td>Applicable</td>
</tr>
<tr>
<td>D. Funding</td>
<td>2.18</td>
<td>6th</td>
<td>Applicable</td>
</tr>
<tr>
<td>E. Space and Facilities</td>
<td>2.68</td>
<td>1st</td>
<td>Very Applicable</td>
</tr>
<tr>
<td>F. Incentive, Opportunities and Reward System</td>
<td>2.42</td>
<td>3rd</td>
<td>Applicable</td>
</tr>
<tr>
<td>G. Networking and Linkages</td>
<td>2.54</td>
<td>2nd</td>
<td>Applicable</td>
</tr>
<tr>
<td>Average Mean</td>
<td>2.37</td>
<td></td>
<td>Applicable</td>
</tr>
</tbody>
</table>
The letter of request was forwarded to the Vice – President for Academics usually with the assistance of the Director for Research and/or the dean of the College of Education. Approval of the request took about a week or two and the collation of questionnaires took from a minimum of one week to a maximum of two months.

The actual conduct of the survey started in July 2008 with Manuel S. Enverga University Foundation as the researcher’s first station, then to the Adventist University of the Philippines in Silang, Cavite. While waiting for data collection, she proceeded to De La Salle University – Dasmarias, Cavite and then to the University of Batangas in Batangas City. From Batangas City, the researcher administered her survey to the University of Perpetual Help System in Binan, Laguna and proceeded then to De La Salle – Lipa in Lipa City for her last station.

All in all, it took the researcher almost seven months, from July 2008 to January 2009 to be able to complete the administration and collation of the instrument.

Statistical Treatment of Data

The data obtained from the assessment survey questionnaire were processed to provide answers to the questions posed in this research study. Thus, the following steps were followed:

Step 1: Determining the extent of manifestation of the different research components to enhance research culture among HEIs in CALABARZON.

Individual rating for each item included in the assessment instrument was obtained and tabulated according to occupational group of respondents. Total sum of scores for each item per participant were obtained. The mean for each item was computed along with the average mean for the given component.

In order to arrive at a meaningful interpretation of the assessment results, the following ranges with corresponding description and interpretation were used:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description/Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 – 5.0</td>
<td>observed to a very great extent (81% – 100% of the time)</td>
</tr>
<tr>
<td>3.5 – 4.49</td>
<td>observed to a great extent (61% – 80% of the time)</td>
</tr>
<tr>
<td>2.5 – 3.49</td>
<td>observed to a moderate extent (41% – 60% of the time)</td>
</tr>
<tr>
<td>1.5 – 2.49</td>
<td>observed to a least extent (21% – 40% of the time)</td>
</tr>
<tr>
<td>1.0 – 1.49</td>
<td>poorly observed (1% – 20% of the time)</td>
</tr>
</tbody>
</table>
The discrepancy between obtained mean for each item for a given component and the standard which was set at five was obtained. According to Provus (1969) by Eisner (1993), program evaluation is the process of defining or agreeing upon program standards objectives; determining whether a discrepancy exists between some aspect of the program performance and the standards governing that aspect of the program, and using discrepancy information to decide whether to improve, maintain or terminate a program or change some aspects of it. In addition, Provus (1969) by Householder and Bosser (2006) explained that the operational definition of program evaluation leads to possible alternatives: a) the program can be terminated, b) the program can proceed unaltered, c) the performance of the program can be altered, and d) the standards governing the program can be altered.

Step 2. Identifying the strengths and weaknesses of the program

Research components and their indicators which were assessed with a computed mean rating of less than 5 were considered the weaknesses of the program. This is in accordance with the principles of quality assurance, i.e., program’s components that are rated highly by stakeholders are considered acceptable or indicators of program’s effectiveness (Daft, 1998).

Step 3. Determining the bases for the development of a primer to enhance research culture

To come up with a primer to enhance research culture, the researcher considered a standard performance of success based on Total Quality Management (TQM) or Total Quality Assurance (TQA), hence, such primer must be intended for the management to take effort in striving to perfect the entire process through improvements in quality productivity and services (Daft, 1991), in this particular case, the enhancement of research culture among HEIs in CALABARZON Region.

Specifically, a scale must be set such as the 4 – point, 5 – point, 7 – point scales or others. If a specific program or component is assessed using the five – point scale, the mean of the raters must be determined and gaps be solved. Examples are as follows:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Weighted Mean</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3.90</td>
<td>1.10</td>
</tr>
<tr>
<td>5</td>
<td>4.25</td>
<td>.65</td>
</tr>
<tr>
<td>5</td>
<td>4.67</td>
<td>.33</td>
</tr>
<tr>
<td>5</td>
<td>5.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>
The last example is perfect and therefore there is total quality or success related to the program or component. However, the first three examples have gaps, meaning these should be further developed or enhanced in order to attain quality services.

In the present research, there are components that have high weighted means but none attained perfect assessment. Arbitrarily, the researcher deemed it wiser to consider those with high weighted means as strengths or programs or components while those with lower weighted means as weaknesses. However, both should be enhanced, further developed or solved in order to attain total quality services. Corollary to the above, Schermerhorn (2005) stated that there are four attributes of quality management. Such quality standards were used in the interpretation of results and gaps in this study.

Step 4. Comparing the significant difference on the assessment between and among the four groups of respondents

To determine if there is a significant difference in the means between and among the four groups of respondents, Pearson Product Moment of Correlation was used.

**Development of a Primer to Enhance Research Culture Among HEIs**

To develop a primer to enhance research culture among HEIs, the researcher followed the following steps:

**Step 1. Preparation of the Primer**

The researcher conducted quantitative analysis of the responses of the participants of the study. The research components and their corresponding indicators which are considered as weaknesses of the program through total quality management were given emphasis in the development of the primer. Review of related literature was also done by the researcher to enrich the contents of the output of the present study. After the completion of the primer, the researcher consulted the two advisers for their comments and suggestions to improve its contents.

**Stage 2. Validation and Revision of the Primer**

The proposed primer to enhance research culture among HEIs was assessed and validated by ten (10) educators such as deans, research director, and faculty who are involved in the conduct of research.
In order to arrive at a meaningful interpretation of the assessment, the following ranges with corresponding description and interpretation were used:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description/Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Very Acceptable</td>
</tr>
<tr>
<td>3</td>
<td>Acceptable</td>
</tr>
<tr>
<td>2</td>
<td>Fairly Acceptable</td>
</tr>
<tr>
<td>1</td>
<td>Needs Improvement</td>
</tr>
</tbody>
</table>

Comments and suggestions of the experts were incorporated in the revision of the primer.

**PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA**

This chapter provides for the presentation, analysis and interpretation of the data obtained from the research study. The numerical data gathered from the accomplished assessment survey questionnaire administered to four (4) groups of survey participants composed of forty eight (48) top managers, fifty two middle managers (52), college faculty, one hundred twenty five (125) and graduate students, one hundred twenty four (124) representing the stakeholders of the Private Higher Education Institutions in Region IV A – CALABARZON are presented in tables.

Analysis and interpretation of the data obtained through the application of appropriate descriptive statistics such as the means, average means, gaps or discrepancies from the standard, general weighted means and rankings were also included in the tables presented. Comments and suggestions of survey participants obtained during the interview are also included in the discussions or explanations of assessment results. Also, results of computations of the tests of significant difference in the assessments between and among the survey participants using statistical tools such as the Weighted Mean and Pearson Product Moment of Correlation and corresponding interpretations were likewise presented in tables. Discussion and explanations of the results obtained are also given. The obtained data are sequentially organized to answer the questions posed in this study as presented in Chapter 1.

Problem 1. What is the extent of manifestation of the following components of research culture as perceived by the top management, middle management, faculty and graduate students:

- leadership competence of the research leader;
- management skills of the research leader;
research capability of faculty;
- funding;
- space and facilities;
- incentives, opportunities and reward system; and
- networking and linkages?

What are the strengths and weaknesses of each component?

The following table presents the participants’ assessment on how the various components enhance research culture. The average mean for each indicator by the groups of respondent was computed along with the average weighted mean for the whole group, ranked according to effectiveness.

It can be seen in the data shown in Table 4 that the top two ranked indicators for leadership competence of the research leader as a research component are: indicator 2.b., “demonstrates integrity”; and indicator 3, “takes pride of and highlights the accomplishments and achievements of its research faculty”. These appear to be their strengths. On the other hand, the last two ranked indicators of the component are: indicator 2.e., “finds innovative solutions to new problem”; and indicator 6, “sees to it that nearly every operation within the institution impacted in one way or another by the conduct of research”. These appear to be their weaknesses. However, a gap of .75 exists between the general mean of 4.25 and the perfect rating of 5 of TQA, hence, the need to strengthen the leadership competence among research leaders in CALABARZON’s HEI’s. If TQM is to be considered, the general mean is 4.25 and the gap is .75, hence leadership competence must be further strengthened.

The strengths identified in so far as leadership competence is concerned could be justified using the comments obtained from the faculty respondents:

“Our Research Director is very committed to his job. He is always ready to lend a hand”.

This is proven by Hoy and Miskel (2008) that integrity means that the leaders are consistent with their stated values.

Another faculty commented that:

“We truly admire our Research Director. We have reach this far-across all levels – institutional, provincial, regional, national and international levels in sharing the results of researches done by our faculty.”
Bush and Glover (2003) as cited by Earley and Weindling (2004) agreed with the above statement and explained that leadership shall provide the drive and direction for raising achievement. In addition, Palestini (2001) confirmed that leaders should build a long and lasting legacy of accomplishment that is institutionalized for posterity. They are obliged to provide and maintain direction by developing a vision by believing in the potential of people; believing in their diversity and gifts.

On the other hand, the weaknesses identified relative to leadership competence could be affirmed by comments of the participants: One of them commented that:

"Most of the researches conducted are externally funded. So, staff of the Research Office is the one who conduct them".

A Research Director commented that:

"We have plenty of externally funded researches. We lack school – based researches like researches on policies of the schools, etc."

The above pronouncements contradict the statement of Rosas (2007) who opined that research can provide data that help describe and monitor important educational concerns and can provide means of inquiry for planning and decision – making. Likewise, Buzar (2001) agreed with Rosas (2007) when he said that the researches undertaken in our colleges and universities have somehow recognized the value of research for educational reform and for societal development.

The data shown point out the top two ranked indicators for the research component, management skills of the research leader. They are: indicator 1, “practices networking among and between schools, departments, research Institutes or Centers”; and indicator 3, “hires the right people for the jobs to augment the demands of the institution’s research strategy”. These appear to be their strengths. On the other hand, the least ranked indicators of the component are indicator 6, “generates funds or grants for research”; and indicator 4, “meets the needs of teachers in the conduct of research”. These appear to be their weaknesses. In this particular case, a gap of .89 exists between the obtained average mean of 4.11 and the TQM’s perfect rating of 5, which clearly implies that the HEI’s research leader’s management skills should be further enhanced.

A group of faculty researchers commented that:
“Our Research Director is very active in terms of networking and linkaging. This is very evident in the researches we conducted. We are funded by various agencies, even the church supported us. He is also very active in different research organizations being one of the founders of CRC and active in NOCEI”.

Observations revealed that the research leader practices networking and linkaging because the researcher of this study has been offered to have this kind of agreement by one of the HEIs. These HEIs are also the founders of organizations that are active in the conduct of research such as CALABARZON Research Council (CRC) and Network of CALABARZON Educational Institutions (NOCEI). The research leaders in these institutions are extending their assistance to other HEIs such as the institution with which the researcher of this study is connected. The researcher was also invited by some of these HEIs in their research colloquia where researches conducted by their faculty are being presented.

Examining the documents of the HEIs included in this study, it was found out that the management skills of the research leader are very important. It is very evident in their newsletters, brochures, manuals and policies wherein the activities and timeframe as well as the operations of the Research Center or Institutes are well spelled out. Two HEIs included in the study were awarded by the Commission on Higher Education Department for their outstanding achievement in research.

These are further supported by the statement of Kulakowski and Chronister (2006) that research manager should practice networking among and between schools, departments, Research Institutes or Center. This is supported by Goleman (2000) who opined that managers should process proficiency at cultivating and maintaining a web of relationships.

In relation to the last two ranked indicators of management skills of the research leader as a component for the present study, one of the faculty members shared that:

“We have not heard that our research leader generates fund for research but we are required to conduct research”.

Another faculty member commented that:

“In our institution, fund for research comes from the institutional budget not from outside sources like research grants. This is the reason may be why only few faculty members would like to conduct research”.
It should be emphasized that research leader is responsible for generating funds as what Earley and Weindling (2004) pointed out that many school managers functioned as superb examples of “resource investigators”. They investigate new initiatives and make use of the resulting funding, they found appropriate resources to support their work and they gather evidence to help decide how to react to new initiatives.

In terms of research capability as a component to enhance research culture among HEI’s in CLABARZON, table 6 shows the participants’ general assessment equivalent to a mean of 3.99 verbally interpreted as “observed to a great extent”. This means that the faculty in the HEI’s in CALBARZON generally demonstrates to a great extent their research capability which contributes to the development of research culture in their institutions. Looking at the table, one could exactly point at indicator 6, “The faculty manifest research – oriented attitudes” and indicator 1, “The number of train faculty/researchers with doctorate and masters degrees is adequate” as the two top ranked indicators of research capability of faculty and they appear to be the HEI’s strengths. On the other hand, indicator 5, “The faculty are trained in research pedagogy to serve as research advisers”, and indicator 4, “The faculty have established long tradition of exploring their own research agenda” constitute the two least ranked indicators of research capability of faculty and therefore may be the HEI’s weaknesses in that area or component of research culture. However, while the aforementioned indicators may appear to be weaknesses, it can be gleaned from the table that they have been found to be observed to a great extent which implies that the HB’s involved in this study have faculty who have demonstrated their research capability quite well. But then, considering TQA, a gap of 1.01 exists between the average mean of 3.99 and the perfect rating of 5; hence it can be inferred that HB’s still need to strengthen their faculty’s research capability.

One of the faculty members commented that:

“Most of our faculty members are willing to conduct research. And to further hone the research skills, trainings are conducted by our fellow faculty who have obtained their doctorate degrees”

A graduate student who is also a faculty of an HEI shared that:

“Faculty members in the graduate school have already obtained their doctorate degrees and they are very much trained as research advisers.”
The average mean of 3.99 and the perfect rating of 5; hence it can be inferred that HEI’s still need to strengthen their faculty’s research capability.

One of the faculty members commented that:

“Most of our faculty members are willing to conduct research. And to further hone the research skills, trainings are conducted by our fellow faculty who have obtained their doctorate degrees”

A graduate student who is also a faculty of an HEI shared that:

“Faculty members in the graduate school have already obtained their doctorate degrees and they are very much trained as research advisers.”

The above stated comments confirmed the researcher’s observations regarding faculty members of HEI’s with masters and doctorate degrees and their active involvement as paper examiners and presenters. Defensor (2008) findings also revealed that in Region 4 – A, 8% of the faculty is Ph.D. holders and 33.5% are master’s degree holders. Smolicz (2001) confirmed that the qualifications of academic staff have been used as the yardstick in accrediting institutions.

The data also shows the extent of manifestation of funding as a component to enhance research culture among HEI’s in CALABARZON Region. Generally, it shows that funding indicators have been found to be “observed to a great extent” in terms of enhancing research culture among the HEI participants. As evidenced by a weighted mean of 3.84. While that is so, still a gap of 1.16 is noted compared to the desired rating of 5 to achieve TQA. Among the indicators “observed to a great extent”, indicator 3, “Funds for faculty and staff development such as attendance to seminars, workshops, conferences, fora and fieldwork to both staff and researchers are adequate and on transparent basis”; and indicator 1, “Institutional budget for research is allotted”, were the two top ranked indicators of funding as components to enhance research culture, and therefore regarded as the HEI’s strengths; while indicator 5f, “The institution avails funds for research from other agencies of Japan, Norway, United Kingdom, Australia, Canada, etc.; and indicator 5e, “The institution avails funds for research from international agencies such as UNICEF, World Bank, Asian Development Bank” constitute the two least ranked indicators and are regarded as the HEI’s weaknesses in terms of funding as components to enhance research culture. It can be inferred from the findings that while the weighted mean indicates great manifestation, the identified gap based on TQM standards implies the need to further strengthen the funding component.
As one of the faculty members commented:

“Our institution provides fund for research and for faculty and staff development such as our attendance to trainings and seminars”.

On the contrary, another faculty shared that:

“It is only the deans who are given the chance to avail of the funds to attend trainings, so it is not surprising that many of us are not interested to conduct research”.

It was commented by one of the research leaders that:

“Funds are available (3 million is allotted for research three years ago) but only few availed because only few conduct research”.

Researcher’s own observations and analysis and examinations of documents such as brochures, newsletters and manuals show evidences of funding, both internal and external, of the conduct of research as well as funding for research trainings and faculty development for research. These are also evidences indicating the institution’s support in the form of financial assistance for the conduct of research.

However, the aforementioned statements run counter to the report of the National Institute for Educational Research (NIER, 1998) that among the large number of academic staff, many do not have any research activity either because they are not or no longer interested or have no financial research resources. Likewise, Bernardo (1998) confirmed the above report by enunciating that in an environment where financial support for research is scarce and sporadic, one cannot expect that many researchers will be able to design extended research programs to meaningfully address a particular problem. In relation to the last two indicators, it was observed by the researcher that most HEIs do not avail funding from foreign and international agencies except for the two institutions who are recipient of the CHED Republica Award which the award is given by the said commission to institution with outstanding research program in the region and part of the program is the availability of research funds either internally or externally.

In terms of the extent of manifestation of space and facilities to enhance research culture among HEIs, Table 8 generally shows an assessment of its indicators equivalent to a weighted mean of 4.04 verbally interpreted “observed to a great extent”. A gap of .96, however, exists between the weighted mean and the perfect rating of 5 to achieve TQA,
which implies the need to further strengthen the component of space and facilities to enhance research culture.

In this particular area, perceived to be HEIs’ strength is the table’s top ranked indicators, indicator 2, “Research Institutes or Research Centers are integrated within over – all academic and administrative structure” and on the other hand, perceived to be HEIs’ weakness is the table’s least ranked indicator, indicator 5, “The institution sets a routine three – year cycle for IT equipment and replenishment”.

Based on the researcher’s observations, all HEIs have their research office where the necessary materials in the conduct of research can be found. These observations are supported by Defensor (2007) who shared that there are thirty HEIs in CALABARZON that are actively involved in research and twenty of them have research units.

As to incentive, opportunities and reward system as a component to enhance research culture among HEI’s in CALABARZON Region, Table 9 shows a weighted mean of 4.08 which represents the over – all extent of manifestation of incentive, opportunities and reward system to enhance HEI’s research culture verbally interpreted as “observed to a great extent. The mean of 4.08 has a gap of .92 from the desired rating of 5 according to TQM.

Specifically, the table identifies the two top ranked indicators: indicator 1, “The institution gives monetary (cash incentives, honorarium) to outstanding faculty members who were chosen to present a research paper to conferences locally and internationally”; and indicator 4 a, “Opportunities among faculty members to attend conferences and fora both local and international covering travel and incident expenses are provided” which can be regarded as the HEIs’ strengths. On the other hand, the two least indicators: indicator 3, “The institution has provision of leaves (sabbatical leave) for faculty to do research”; and indicator 5, “Incentives are provided for productive research performance through adequate faculty salaries” may be regarded as HEIs’ weaknesses in the area of incentives, opportunities and reward system as components to enhance research culture among HEIs in CALABARZON Region. It is therefore on the latter that HEIs need to be enhanced further and consequently, enhance their research culture.

In one of the interviews conducted by the researcher, she discovered that there were HEIs whose president were generous enough to provide cash incentives for those faculty and researchers who were able to present their papers in various fora.
In this study, Pascua (1999) commented that research should be given due recognition in faculty development, in the allocation of human and financial resources. Eden (1998) added that rewards should not only be given but also be made public. Moreover, in the same interviews, the researcher was able to establish the truth behind HEI’s practice of allowing sabbatical leave among faculty who expressed their intention in conducting their research. Added to this provision for incentives to faculty researchers vary from one HEI to another. There are HEIs included in the present study that offers such opportunity and incorporated that particular provision in their Research Manual. Other institutions could offer workload credit instead of sabbatical which is stipulated in their bulletin board.

Although Corpuz (2006) opined that sabbaticals allow employees more time for conducting research, Awayan (2002) explained that universities have no uniform policy on research. Because of financial restrictions, few institutions are able to provide their teaching staff with sabbatical leaves.

On the extent of manifestation of networking and linkages as a component to enhance research culture, Table 10 on the next page indicated a general assessment described as “observed to a great extent” as evidenced by a weighted mean of 3.95 with indicator 1, “Research network is developed and sustained through external research collaboration with private companies, government institutions and other universities” at the top of the rank among indicators, and indicator 5, “Interfaculty collaboration among different colleges is conducted” occupying the least among the indicators. The former indicator seems to appear as the HEI’s strength while the latter indicator as their weakness. However, in consideration of TQM scale, a gap of 1.05 exist which implies that there is still a need to further enhance the research culture among HEI’s in CLABARZON Region in the component of networking and linkages.

The researcher affirms the comment through her own observations that researchers from HEIs that participated in his study have already established some kind of professional relationships with one another that facilitated their partnership and collaboration in the conduct of research.

Evidently though, networking and linkages already exist among HEIs in the CALABARZON Region, one faculty member commented that:

“There are a lot of researches conducted in our institution which is in partnership with other colleges and universities in the region because by doing this there will be sharing of resources and manpower!”
On the contrary, the conduct of collaborative research with other institutions poses a problem with other institutions. A faculty member commented:

"It is difficult on our part to conduct research with faculty members from another college because we have varied schedule. Definitely, time constraint is a factor why interfaculty collaboration is not possible aside from conflict of interests".

Calata (1999) mentioned that university presents a conundrum when it comes to collaboration, consensus and working as a team. Few organizational settings espouse collegiality and collaboration than the academic institution, yet fewer seem to struggle so much in actually working as a team. With this as a situationer, it can be inferred from this particular finding and observations that while networking and linkages and collaboration have been found to be "observed to a great extent". HEIs through their respective research leaders have to work harder to enhance their research culture through an effective and strong networking and linkages.

Problem 1.1: What are the strengths and weaknesses of each component to research culture?

As a whole, the participants perceived all the research components as having "observed to a great extent" as indicated by an average weighted mean of 4.04. This clearly implies that the research culture among HEIs in CALBARZON Region is very perceived to be strong. However, from the perspective of TQM, an average gap of 0.96 has been established which indicated that while the research culture has been found to be strong, there is an evident need to make it even stronger and attain the desired strength based on TQM.

It can be gleaned from the table that among the seven components of research culture, the components on research capability of faculty, networking and linkages and funding appear to be in the priority list of components needing further enhancement. Magno (2002) in her study stressed, in particular, the provision of support services, incentives and rewards for research productivity, flexible staff movement, support services and improving the faculty’s capacities to do research as vital in enhancing research culture in an institution.

Problem 2: Are there significant relationships between and among the extent of manifestation of the various components of research culture as perceived by the:


- top management;
- middle management;
- faculty; and
- graduate students?

Using Pearson r, the study found out that a very high positive correlation exists between and among the various research cultural components; hence the null hypothesis is rejected. This clearly shows that one component is as important and needed as the other in enhancing an institutions’ research culture. Moreover, the very high positive correlation indicated that one component is directly related to another component, such that leadership competence of the research leader is directly related with management skill of the research leader; research capability of faculty; funding; space and facilities; incentives, opportunities and reward system; and networking and linkages are directly related with each other and, therefore, dependent on each other. A relationship establishes the theory that the development and enhancement of an institution’s research culture depends upon the management’s equal attention to all the components. Consequently, failure on the part of the management to pay particular attention to even one component may produce an adverse effect on the institution’s research culture. Reyes (2007) observes that most institutions have almost the same issues and concerns and regards to poor research capabilities particularly to research leadership and priorities as well as low or poor research competence among faculty. These dilemmas have contributed greatly to the continuous decline in the interest and enthusiasm to put research as one top priority of an HEI. Accordingly, this has been further aggravated by the limited number of national research organizations to coordinate efforts in research, poor research linkages, inadequate mechanism for research dissemination and a lot more of concerns. If these will not be given priority research culture will not be enhanced or sustained.

Problem 3: Based on the findings, what primer can be developed to enhance research culture among HEIs in CALABARZON?

The findings of the study require seven (7) research components that need to be improved in relation to gaps computed.

Based on the findings of this study, a primer that can be used by the management of HBs to enhance their research culture has been developed. It should be noted that this study generally reveals, among all others, that the research culture indicators of all the components have been found to have been “observed to a great extent” and, therefore, shows evidences of the extent of manifestation of research culture. This, however, does not necessarily mean that there is no need for a primer to enhance research
From the standpoint of TQM, a gap between the desired and the actual has been evident and this, in particular, warrants the development of a primer.

<table>
<thead>
<tr>
<th>Research Component</th>
<th>Indicators for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>• The institution avails funds for research from other agencies of Japan, Norway, United Kingdom, Australia, Canada, etc.</td>
</tr>
<tr>
<td></td>
<td>• The institution avails funds for research from international agencies such as UNICEF, World Bank, Asian Development Bank, etc.</td>
</tr>
<tr>
<td></td>
<td>• The institution avails funds for research from city and provincial government</td>
</tr>
<tr>
<td></td>
<td>• The institution avails funds for research from CHED</td>
</tr>
<tr>
<td></td>
<td>• The institution avails funds for research from government agencies such as DOST for science-related research projects, Department of Energy for energy-related concerns, etc.</td>
</tr>
<tr>
<td></td>
<td>• Funds for postgraduate researches and post doctorate fellowships are appropriated</td>
</tr>
<tr>
<td></td>
<td>• The institution avails fund from FAPE</td>
</tr>
<tr>
<td></td>
<td>• Funds for research infrastructure and funding for library supporting research is provided</td>
</tr>
<tr>
<td></td>
<td>• Institutional budget for research is allotted</td>
</tr>
<tr>
<td></td>
<td>• Funds for faculty and staff development such as attendance to seminars, workshops, conferences, fora and fieldwork to both staff and researchers are adequate and on transparent basis</td>
</tr>
<tr>
<td>Networking and</td>
<td>• Interfaculty collaboration among different colleges is conducted</td>
</tr>
<tr>
<td>Linkages</td>
<td>• Consultancy for government and industry research is provided</td>
</tr>
<tr>
<td></td>
<td>• Partnerships with key government agencies in its locality in the conduct of research projects to testify its commitment in achieving its vision as a center of research relevant to the region are established</td>
</tr>
<tr>
<td></td>
<td>• Consortium arrangements are entered with institutions that have established records</td>
</tr>
<tr>
<td></td>
<td>• Research network is developed and sustained through external research collaboration with private companies, government institutions and other universities</td>
</tr>
<tr>
<td>Research Capability of</td>
<td>• The faculty are trained in research pedagogy to serve as research advisors</td>
</tr>
<tr>
<td>Faculty</td>
<td>• The faculty have established long tradition of exploring</td>
</tr>
<tr>
<td>Research Component</td>
<td>Indicators for Improvement</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>their own research agenda</td>
</tr>
<tr>
<td></td>
<td>The faculty establish a good track record based on previous researches conducted</td>
</tr>
<tr>
<td></td>
<td>previous researches published in local and international refereed journals</td>
</tr>
<tr>
<td></td>
<td>The faculty are aware of research funding, project management, knowledge transfer and commercialization</td>
</tr>
<tr>
<td></td>
<td>The number of faculty who are members of relevant subject panels and professional organizations actively involve in the conduct of research is adequate.</td>
</tr>
<tr>
<td></td>
<td>The number of trained faculty with doctorate and master degrees is adequate</td>
</tr>
<tr>
<td></td>
<td>The faculty manifest research – oriented attitudes</td>
</tr>
<tr>
<td>Space and Facilities</td>
<td>The institution sets a routine three – year cycle for IT equipment and replenishment</td>
</tr>
<tr>
<td></td>
<td>The institution invests in state of the art research facilities like internet, statistical software and equipment</td>
</tr>
<tr>
<td></td>
<td>The institution maintains a Research Database, archiving individual research achievements including grants, contracts, publications (research journals, newsletters, etc.)</td>
</tr>
<tr>
<td></td>
<td>Research Institutes or Research Centers headed by a Research Director with the necessary staff and facilities are set up.</td>
</tr>
<tr>
<td></td>
<td>Research Institutes or Research Centers headed by a Research Director with the necessary staff and facilities are set up.</td>
</tr>
<tr>
<td>Incentives, Opportunities and Reward System</td>
<td>The institution has provision of leaves (sabbatical leave) for faculty to do research</td>
</tr>
<tr>
<td></td>
<td>Incentives are provided for productive research performance through adequate faculty salaries</td>
</tr>
<tr>
<td></td>
<td>Incentives are provided for productive research performance through workload credits</td>
</tr>
<tr>
<td></td>
<td>The institution has provision for faculty deloading to have enough time to conduct research</td>
</tr>
<tr>
<td></td>
<td>Incentives are provided for productive research performance through merit pay system</td>
</tr>
<tr>
<td></td>
<td>The institution gives non-monetary (promotion, certificates, workload credits)</td>
</tr>
<tr>
<td></td>
<td>to outstanding faculty/researchers who were chosen to present a research paper to conferences locally and internationally</td>
</tr>
<tr>
<td></td>
<td>Opportunities among faculty/researchers to attend</td>
</tr>
<tr>
<td>Research Component</td>
<td>Indicators for Improvement</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>• present papers in conferences and for a both local and international covering travel and incident expenses are provided</td>
</tr>
<tr>
<td></td>
<td>• The institution gives monetary (cash incentives, honorarium) to outstanding faculty/researchers who were chosen to present paper to conferences locally and internationally</td>
</tr>
<tr>
<td>Management Skills of the Research Leader</td>
<td>• Generates funds or grants for research</td>
</tr>
<tr>
<td></td>
<td>• Meets the needs of teachers in the conduct of research</td>
</tr>
<tr>
<td></td>
<td>• Handles the process of research and scholarship</td>
</tr>
<tr>
<td></td>
<td>• Handles the process of submission and oversight of research business</td>
</tr>
<tr>
<td></td>
<td>• Makes sure the budget allotment is in order and adequate</td>
</tr>
<tr>
<td></td>
<td>• Handles the process of project or research proposal</td>
</tr>
<tr>
<td></td>
<td>• Implements regulations and policy set by the government, sponsors and institutions</td>
</tr>
<tr>
<td></td>
<td>• Hires the right people for the jobs to augment the demands of the institution’s research strategy</td>
</tr>
<tr>
<td></td>
<td>• Practices networking among and between schools, departments and Research Institutes or Centers</td>
</tr>
<tr>
<td>Leadership Competence of the Research Leader</td>
<td>• Demonstrates the ability, finds innovative solutions to new problem</td>
</tr>
<tr>
<td></td>
<td>• Sees to it that nearly every operation within the institution is impacted in one way or another by the conduct of research</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates the ability to weigh risk versus reward</td>
</tr>
<tr>
<td></td>
<td>• Supports research commensurate with the national and international standards of excellence</td>
</tr>
<tr>
<td></td>
<td>• Takes the initiative to stay current with the world of sponsors, regulations technology, legislative and other influences of the research agenda</td>
</tr>
<tr>
<td></td>
<td>• Fosters innovations, culture and environment that allow faculty to flourish</td>
</tr>
<tr>
<td></td>
<td>• Stays current with the world of sponsors, regulations technology, legislative and other influences of the research agenda</td>
</tr>
<tr>
<td></td>
<td>• Takes the initiative to learn and grow</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates ethics in solving problem and answering ambiguous questions</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates high level of honesty</td>
</tr>
<tr>
<td></td>
<td>• Takes pride of and highlights the accomplishments and achievements of its research faculty and staff</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates high level of integrity</td>
</tr>
</tbody>
</table>
The table above presents a summary of the research components and their corresponding indicators that serve as baseline data for the development of a primer that can be used to enhance research culture among HEI’s in CALABARZON Region.

The developed Primer on How To Enhance Research Culture Among HEI’s in CALABARZON Region underwent expert validation which involved ten professionals whose position ranges from HEI faculty to deans and research directors.

Results of the validation reveal a weighed mean of 3.61 verbally interpreted “very acceptable”.

In the process of working on the primer, the researcher considered the comments and suggestions advised by the experts validators as the following:

- incorporate the findings of your
- delete questions such as “What is HEI?” and “How does HEI differ from basic education?”
- primer must be user friendly
- revise and improve some questions

In the process of working on the primer, the researcher considered the comments and suggestions advised by the experts validators as the following:

- incorporate the findings of your
- delete questions such as “What is HEI?” and “How does HEI differ from basic education?”
- primer must be user friendly
- revise and improve some questions

One of the validators commented that primer should be user-friendly, thus there is a need to arrange the questions from the least to the most complicated such as start first with what then why followed by how.

As the validator read the questions on funding as a research component, they found out that the question “How can the institution allot funds for faculty and staff development such as attendance to seminars, workshops, conferences, fora and fieldwork to both staff and researchers?” does not jive with the answer. So, it was suggested that the question should be revised to “What are the forms of funds for faculty and staff development?”
For networking and linkages as a research component, it was noticed by the validators that there was a question on the topic but was included in funding, thus, they suggested verifying all questions whether they are in their respective components.

One of the validators also suggested to rephrase a question under Space and Facilities as a research component which is “Why is there a need to establish a Research Institute or Research Centers headed by a Research Director with the necessary staff and facilities are set up”. This was revised into “Why is there a need to establish a Research Institute or Research Centers headed by a Research Director with the necessary staff and facilities?”

For leadership competence of the research leader as a research component, it was suggested that instead of using the word “Dean” it is better to use the word “Program head or Department head”. It was suggested because there are some institutions that use various names to refer to the dean.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of findings, conclusions derived and recommendation based on the findings of the study.

Summary

This study was primarily aimed to assess the extent of manifestation of various components of research culture as perceived by the top management, middle management, faculty and graduate students.

The descriptive instructional development method with application of the Provus Discrepancy Evaluation Model was used in this study. To answer the questions posed in this study, an assessment survey questionnaire, which was developed, validated and established the reliability by the researcher was distributed to four occupational groups: 1) top management, 2) middle management, 3) faculty, and 4) graduate students. Data were also gathered through the use of interviews, observation techniques, documentary analysis and triangulation.

Findings of the Study

The following were the findings and results arrived at in this study:
1. The research components were assessed by the participants of the study as “observed to a great extent”. Based on ranking, the following were the results: leadership competence of the research leader; management skills of the research leader; incentive, opportunities and reward system; space and facilities; research capability of faculty; networking and linkages; and funding. Research culture among HEIs was assessed as weak in the seven areas. These are: funding; networking and linkages; research capability of faculty; space and facilities; incentive, opportunities and reward system; and management skill of the research leader; and leadership competence of the research leader.

2. There are significant relationships existing between and among the research components to enhance research culture among HEIs as perceived by the top management, middle management, faculty and graduate students.

3. There are significant relationship existing between and among the research components to enhance research culture among HEIs as perceived by the top management, middle management, faculty and graduate students.

Conclusions

Based on the findings of the study, the research components to enhance research culture among HEIs are manifested to a great extent.

The research components are weak in seven areas. These are: 1) Funding; 2) Networking and Linkages; 3) Research Capability of Faculty; 4) Space and Facilities; 5) Incentive, Opportunities and Reward System; 6) Management Skills of the Research Leader; and 7) Leadership Competence of the Research Leader.

Because of the findings, a primer has been developed to serve as guide among HEIs to attain total quality assurance (TQA).

Recommendations

In the light of the above findings from the assessment survey conducted for this study, the following are recommended:

1. There is a need to enhance further the following weaknesses of the program which should be given proper consideration or appropriation:
• Funding;
• Networking and Linkages;
• Research Capability of Faculty;
• Space and Facilities;
• Incentive, Opportunities and Reward System;
• Management Skills of the Research Leader; and
• Leadership Competence of the Research Leader.

2. Conduct a yearly assessment of the research program.
As part of its continuous improvement program, a yearly assessment of the research components maybe undertaken by the HBIs to keep track of its activities and development as well as to monitor the implementation of on-going change efforts and initiatives.

3. This study should be replicated in other places of the country. If done, the following should be taken into consideration:

• Use government tertiary institutions;
• Validate further the instrument and the primer; and
• Comparative study of private and public tertiary institutions related to their research capabilities.

BIBLIOGRAPHY

Books


Competing Papers


Published Materials


Palispis, E. S. (2000). Research in higher education focus on its role in teacher education. Harvest, 1 (2), 33-42.


Smolicz, J. J. Privatization in higher education: emerging commonalities and diverse educational perspectives in the Philippines, Australia, Poland and Iran. Philippine Sociological Review, 49 (1), 83.


Conference Papers


Unpublished Materials


Electronic Publications


Statistical Human Resource Development:
The Case of Bukidnon State University, Philippines

Joy M. Mirasol

ABSTRACT

Two trainings on Confirmatory and Exploratory Data Analyses and Data Mining were conducted to enhance the capacity of faculty and step up their development in basic and advanced statistical methodological skills, and their research capability. Training designs were prepared to address the variability of the participants’ educational status. Issues and challenges were raised during the training. These include among others: existing researches are limited and confined only within the parameters of the workplace, wanting for a more in-depth and comprehensive research utilizing data mining as a tool, and aggressive collaboration efforts and linkage among funding institutions. The training likewise motivated and enhanced faculty skills in the use of appropriate statistics methods useful in their research undertakings. Initial results revealed a significant increase in the number of quality and collaborative researches consistent with the vision of the university and established linkage from the local support institutions.

INTRODUCTION

Statistics plays a significant and vital role in various aspects of our society including among others policy-making processes. They are needed for assessing the current situation, objectives setting, targets, as well as, measuring progress and development. There is however a very significant mismatch between the demand for information and the ability of most countries to supply the required statistical information, to effectively address the need for policy-making processes. Strengthening national statistical capability is therefore necessary to enable countries to satisfy their own needs.
The United Nations Statistical Institute for Asia and the Pacific (UNSIAP) for example revealed that training has been the main engine of personnel development in government administration in general and that statistical training has contributed much to the development of National Statistical Agencies (NSAs). Accordingly, training helps in enhancing statisticians’ capabilities to achieve their goals in the changing and dynamic environment where they operate. To respond to the training requirements, training institutes created their own statistical training mechanisms which can be described as: identifying training needs, designing training delivery, actual training process, evaluation of training and follow-up activities/actions (Chultemjamts, UNSIAP).

One of the primary goals of Philippine Higher Education Institutions specifically the Higher Education Research (HER) component, is to take a significant part in the crucial function of enhancing research culture. HER addresses specific problems in industry, business, government and community as problem solvers. It contributed to the formulation of policies, strategies, development programs and decision making at different levels. HER, if effectively carried out including the timely dissemination of results, will contribute significantly to the national development agenda (de la Pena, 2007).

Locally, the Bukidnon State University (BSU) as a premier institution of higher learning in teacher education, sciences and humanities is committed to its mission to develop competitive professionals who are committed to build a sustainable life for all through quality instruction, research, extension and production. It continuously assumed the challenge to develop creative, highly specialized, independent and critical thinking professionals, to make them a wellspring of knowledge that contributes not only to the university’s development, but also for the welfare of the society.

The University’s Research and Development Unit likewise assumed the challenge of providing knowledge when and where it is needed. In 2007, BSU signed a memorandum of agreement (MOA) with Statistical Research and Training Center (SRTC), a government institution and a training arm of the NEDA, to enhance capacity of faculty and step up their development in basic and advanced statistical methodological skills that will be responsive in supporting information-for-planning and decision-making requirements. As a result of the above-cited MOA and training conducted, BSU has been now recognized by SRTC as Regional SRTC Affiliate in Region 10. Two trainings were conducted consecutively to BSU faculty on Confirmatory and Exploratory Data Analysis (CDA and EDA) and Data Mining. Training designs were prepared based on the result of the training needs assessments.
designed to address the variability of the educational status among its participants.

Consequently, this paper examines the initial results of statistical trainings conducted geared towards the research productivity and enhancing the research culture of the institution. Section II discusses the issues on statistics and research before the conduct of the trainings. Section III presents the results of the training which include the training design, major topics, sustainability of the training and challenges. Finally, Section IV provides conclusions and policy recommendations for consideration for the institution as well as the SRTC.

ISSUES

Varied issues generated from the broader spectrum of statistics and research were identified during the conduct of the study, shared by the participants with varied specializations.

On statistics, the following issues were presented: fear and limited knowledge of statistics resulting to less appreciation to do research, and appropriate statistical tools to use on data analysis, processing and interpretation. Accordingly, they find statistics difficult due to the numerous formulas; the need for constant consultation with statisticians and confusions specifically on exploratory data analysis such as association, path, cluster and discriminant analyses among others.

On research, concerns include: lack of confidence to do research due again to limited knowledge on statistics, determination of researchable topics, no experience in the preparation and submission of research proposal before, perception that research is an intellectual exercise for professors only, limited skills and trainings, and the seeming confusion about exploratory data analyses used in research among faculty members. One interesting issue raised is the challenge for an educator to encapsulate the real essence of “research culture” to the students especially on research ethics and the love of doing research as a way of life.

RESULTS

Training Design

Based on the result of the training needs assessment conducted, training designs were formulated. The training designs effectively consider
selection of participants who have manifested interest in doing research based on the program for training developed by SRTC. On March 10–12 and April 14–17, 2008, some 30 faculty members with varied field of specialization participated in the two trainings conducted respectively, represented by the six colleges of the university. The medium of instruction was in English and local dialect (Bisaya) to ensure deeper understanding and open communication among the participants including the use of computer software for hands-on activities.

The methodology was participative and collaborative in nature, ensuring active participation among participants with great emphasis on the information collected made before the conduct of the training. Focus group discussions and focus group interviews with the respondents were done to validate the issues raised by the participants during and after the trainings. Participants were grouped and headed by a senior faculty. They were tasked to develop a research proposal that shall become the training output.

**Major Topics**

For the first training, topics discussed include: (i) Overview of Data Analysis in Research; (ii) Quantitative Research; (iii) Theory Formulation: Factors and Variables; (iv) Descriptive Statistics; (v) Sampling and Sample Size Considerations; (vi) Statistics for Comparing Variables; (vii) Analysis of Variance Techniques; and (viii) Regression Analysis. The second training focused on the topics: (i) Conceptual and Philosophical Differences of CDA and EDA; (ii) Association Analysis; (iii) Cluster Analysis; (iv) Discriminant Analysis; and (v) Principal Components Analysis. These topics were discussed with varied forms of techniques like workshops, demonstrations and lectures, making the participants fully engaged in various activities. Sufficient time was given for open forum for the participants to clarify gray areas and for them to share their ideas related to the topics. After a series of interaction, evidences show that participants have gained interest. They have considered research as a relevant component of the University, hence the development of research proposals become a priority.

**Sustainability of the Training**

Sustainability of developed programs under SRTC and learnings after the training was a major concern (Padua, 2004). In response to this concern, a small research group among participants was organized. This group, who shall meet once a month to keep abreast of the new research trends, develops new research proposals and sustains the momentum. Results of the discussion revealed a substantial thought sharing and generation of ideas concerning the following: (i) peer review of researches and refereeing; (ii)
recent advances in health and environment; (iii) common problems in graduate education; (iv) English language: trends and issues; and (v) some issues in science education research. The group likewise agreed to give priority to the mentoring endeavours for junior researchers.

Initial Results

Data gathered for the last 5 years (2004–2008) include numbers of research proposals submitted for institutional funding, published researches to the BSU journal, faculty researchers and collaborative researches. Based on the data gathered as shown in Table 1, there is a significant increase in number in all aspects of research activities conducted in the year 2008, as against the average number taken from the year 2004 to 2007. Notably, the increase happens after the intervention was conducted which were mostly generated proposals as a result of the training. Figure 1 likewise showed the significant increase and graph of indicators.

Table 1. Data of Indicators for 2004–2008.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research proposals</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>Number of published researches</td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Number of faculty researchers</td>
<td>21</td>
<td>22</td>
<td>21</td>
<td>16</td>
<td>50</td>
</tr>
<tr>
<td>Number of collaborative researches</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

In summary, significant outcomes were noted as initial results after the training. Among them are the following: (i) collaborative researches were done through mentoring, thereby increasing the involvement of junior researchers to do research; (ii) awareness and interest among participants to disseminate research results in local, national and international fora; (iii) secured funding assistance for two commissioned researches and ten institutional research proposals developed based on the knowledge gained during the training; (iv) served as external reactors and referees to nearby institutions; and (v) formulated four research programs concerning Sustainable Development and Environment, ICT Capacity-Building for vulnerable groups, Innovations in Higher Education and Culture and development among Mindanao Indigenous Peoples.
Figure 1. Graph of the indicators from 2004–2008

Challenges

1. There is a need for further collaboration among faculty and establish mechanisms to increase monitoring with participants particularly on research activities.

2. Sustained program for updating particularly on the latest trends in research specifically using data mining as a tool.

3. Sustained guidance and mentoring among junior researchers becomes a challenge to senior researchers.

4. Mechanism to institute a multiplier effect among faculty members who were not participants in the trainings conducted.

IMPLICATIONS

1. Statistical training is an essential means for ensuring improvements of BSU’s research culture.
2. The importance of administrative support towards human resource development and the provision for conducive research and development environment.

3. Sustained endeavors to establish linkage with partners.

4. Programs supporting research will redound to increase in research proposals.

POLICY RECOMMENDATIONS

1. Mainstreaming statistical human resource development program to the university’s faculty capacity development program.

2. Increase personnel component of the Research and Development Unit to include services for linkage with local government units and external support institution.

3. Engage services of external statistical experts to further motivate and update the faculty’s technical capacity.

4. Make mandatory for the university to conduct dissemination at least twice a year to local policy and planning bodies particularly on researches relating to environment and local governance.

5. Allocate at least 10% of the university’s resources generated for research and procurement of equipment and software.

6. Develop incentives mechanism for all well-meaning and pro-active research and development studies.

7. Personnel engaged in statistics and research both in government and private institutions to upgrade their statistical capability by way of trainings.
REFERENCES


Research Capability Building – A Strategy to Promote Research Culture in SUCs and Countryside Development: The Romblon State College Experience

Merian C. Mani 2, Eddie G. Fetalvero 3, Lou G. Foja 4, and Alexander F. Formento 5

ABSTRACT

The Research, Development and Extension Unit of Romblon State College employed strategic solutions to create a research climate, foster research interests and confidence and sustain the enthusiasm of faculty members through varied research capability building seminar workshops (RCBSW) and paper presentations. The R&D performance of the College was evaluated based on the indicators provided by the Commission on Higher Education, accreditation organizations, Department of Budget and Management and a self-assessment of R&D activities from 2003 to the present. The conduct of mandatory RCBSW in all the five institutes and eight campuses of the College increased substantially the number of active researchers and upgraded the performance of the faculty members and the College as a whole. The interventions made by the Southern Tagalog Agriculture and Resources Research and Development Consortium ignited the enthusiasm of the R&D unit causing the institutes and campuses to follow suit. The Philippine Association of Research Managers, Inc. (PHILARM) through its President and the CHED-UPLB Zonal Research Center have also played great roles in the awakening of the unit. The series of collaborative RCBSW conducted by PHILARM served as the groundwork in setting the directions and prioritizing the programs of the College. It also helped the

1 William C. Medrano Best R&D Management Paper during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Research Director, Romblon State College, Odiongan, Romblon
3 Research Coordinator, Institute of Business and Accountancy, Romblon State College, Odiongan, Romblon
4 Director for Budget and Finance, Romblon State College, Odiongan, Romblon
5 Vice President for Research, Development and Extension, Romblon State College, Odiongan, Romblon
College in defining its course of actions and in formulating annual performance targets for R&D. Institutional initiatives were fully implemented. Policies and guidelines on benefits, opportunities and grants were realized. Research linkages and networks were forged with local and international entities. Research climate was established and sustained. Research outputs were presented, published, disseminated and adopted; some were commercialized. Local government units facilitated the adoption of technologies in the countryside. Private entrepreneurs were also benefited from the technologies generated.

RATIONALE

The Romblon State College (RSC) is the only state college in the province of Romblon. Founded in 1915 as the Odiongan Farm School offering immediate courses in agriculture, it was converted into Odiongan Rural High School in 1929 offering complete secondary agricultural curriculum until 1946. In the following year, it was again converted into Odiongan High School offering four-year General Type A curriculum until 1956.

On December 31, 1956, by virtue of Republic Act 1391, the Odiongan High School was converted into Odiongan National Agricultural School offering complete Secondary Vocational Agricultural curriculum but was later renamed as the Romblon National Agricultural School by virtue of the General Appropriations Act of 1958. By virtue of Republic Act 4286 passed on July 1, 1965, Romblon National Agricultural School was converted into Romblon National Agricultural College in 1969. After five years, it became Romblon Agricultural College offering two-year Associate in Agriculture Technology under the Department of Education Culture and Sports Circular No. 8 S. 1974. On June 25, 1975, several four-year degree programs like Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Education and Bachelor of Science in Home Technology were offered upon approval of then DECS Secretary Hon. Juan L. Manuel.

In 1983, the Hon. Nemesio V. Ganan, Jr. authored Parliamentary Bill 131 which was passed into law on May 18, 1983 known as Batas Pambansa Blg. 393 which mandated the College to offer eight undergraduate programs and three graduate degree programs.

The Board of Trustees of the College is empowered to offer additional programs aside from those that are embodied in the charter. Today the College offers nine graduate degree programs, 15 undergraduate degree
programs, five ladderized courses, seven vocational/technical courses and a secondary course program. Moreover, there are two higher education institutions (HEIs) supervised by the Commission on Higher Education (CHED) namely, the Romblon College of Fisheries and Forestry in San Andres, Romblon with eight satellite campuses and the Sibuyan Polytechnic College in San Fernando, Romblon that have been integrated with RSC. Being a level II state college, RSC is tasked to perform instruction, research, extension and production. From its humble beginning as a farm school, it has grown into a comprehensive college which now offers a Doctoral program in Educational Management, a consortium with the Philippine Normal University.

RSC is aggressively pushing to be a center of excellence for instruction in agriculture, the art, sciences and functional scientific, social and technological researches; relevant extension services and quality production towards empowerment of graduates for sustainable development. It provides quality education through modernization, accreditation and effective consultation and linkages. It enhances research through expansion of commodity coverage and empowerment of faculty and staff members; intensifies extension through provision of impact projects; and improves production through the optimal utilization of available resources, making its graduates effective development managers and useful citizens in the community.

In the previous years, R&D focused on the four areas of discipline: agriculture and fisheries, social sciences and education, vocational and technical education and arts and sciences. Now, the unit has metamorphosed into a Research and Development Center with eight areas. It has institutionalized the research function of the College. The 14-hectare campus in Odiongan is utilized for agricultural researches. It has acquired another 82 hectare agricultural land in Agpudlos, San Andres, Romblon where the AgroMet, RATC, ROCKS and the small ruminants are housed. It has expanded into campuses. Today the College has 13 research centers.

Side by side with the research function, the extension function is in close coordination in order to complete the RD&E continuum thus making the College responsive to the needs and concerns of the stakeholders in various areas.
Objectives

1. To assess the research capability of the faculty members and the extent of the R&D functions of the College as a whole from school year 2003–04 to 2008–09.

2. To promote research capability building activities as a strategic solution in fostering interests of faculty and in establishing research culture among SUCs with poor R&D performance.

3. To account the extent of utilization of the research outputs by different stakeholders.

4. To trace how R&D outputs contribute in countryside development.

CONCEPTUAL FRAMEWORK

METHODOLOGY

The study was conducted to assess the performance of the research and development function of the College. It specifically determined the research capability of the faculty members and the College as a whole after interventions had been provided. These activities involved the conduct of research capability building seminars and workshops, implementation of guidelines in the conduct of research, provisions of benefits and privileges and other institutional initiatives to further motivate faculty members to engage in research. After these activities and interventions had been made, the outputs of the faculty members and the College as a whole were summarized using the criteria set by the Commission on Higher Education and Department of Budget and Management.
Research capability indicators of faculty members and the College are the following:

1. Number of active researchers.
2. Number of researches published in refereed journals locally and abroad.
3. Number of research outputs utilized.
4. Number of research disseminated in appropriate scientific symposia, seminars, conferences.
5. Number of R&D proposals endorsed by DBM for funding.
6. Number of R&D projects funded by external sources locally and abroad.
7. Number of GAA and locally funded R&D projects.
8. Number of completed R&D projects not yet reported and published.
9. Number of awards of distinction given to faculty R&D projects.
10. Number of R&D reviews, seminars and symposia conducted.
11. Annual appropriation (GAA) for research in Philippine pesos.

Other indicators to evaluate the College which served as bases in determining research capability are: (i) publications (flyers, brochures, books, newsletters, video CD); (ii) patents; (iii) copyrights; (iv) MOA; and (v) technology adopters.

FINDINGS AND DISCUSSIONS

The RDE Unit: Then and Now

Research activities have never been attractive to the faculty members since the school was established in 1915 until it became an Agricultural College in 1969. Within almost 40 years of existence as a College, its Research Development and Extension Center (RDEC) has not fully matured. The RDE unit of the College was established in 1980 only. The unit then focused on agricultural researches particularly crop and animal sciences. In 1988 the unit was manned by an agricultural engineer who planned the organizational structure of the unit and established linkages with other State Universities and Colleges, Government and Non-Government Agencies. The directorship of the unit was then transferred in 1996 to another expert whose leadership focused on the framing of the RDE Manual of Operations aside from the experimental researches conducted. After three years, the headship of the RDE unit was given to another senior faculty member. From 2002 until October 2007, three more directors were appointed one at a time. There was a fast turnover of leadership of the unit. This might be accounted to the earnest desire of the administration to make the unit functional and operational. Unfortunately, earning the first point in Research and Development was not met. In October 2007, the administration decided to
appoint one director for research and one extension director under the office of the Vice President for Research Development and Extension. This decision was in compliance with one of the recommendations made by the AACCUP Accreditation team. The outset of 2008 brought new opportunities for the College’s RDE unit.

Agenda Setting and Program Prioritization through PHILARM, CHED-UPLB-ZRC and STARRDEC

The new leadership believed in the scientific and teamwork management approach in sustaining the research climate in a comprehensive college. The director believed that success in research could only be possible by joining the loop and networking with other SUCs, NGOs, GAs and funding agencies, thus, breaking the wall of inculturation and paving the way for the new ideas and methodology in RDE. The RDE management had to employ unique strategies and appropriate and relevant techniques. The R&D activities must jibe with the national, regional and local research agenda. Most likely these agenda spelled out the needs and concerns of stakeholders. Guided by the above principles, the unit conducted an RCBSW. This was a rigid situational analysis which involved participation from different agencies, whose thrusts and priorities were highly considered and SWOT Analysis. In the environmental analysis, the opportunities and threats were summarized. The organizational analysis dissected the assessment areas with the corresponding strengths and weaknesses. This was followed by the identification of the Key Areas of Concern using the external and internal analysis method. The process moved to the criteria setting employing the “must” and “discriminating” criteria. Then, the evaluation and priority setting were done. Finally the College was able to come up with a reliable and clear R&D program priorities. This was one of the most helpful activities among the many research capability building seminars and, workshops done in the past.

The above activity facilitated by an expert from PHILARM, CHED-UPLB Zonal Research Center and STARRDEC confirmed the data gathered by the RDE Center through its director in an area scanning which revealed the following findings: that RSC has potential researchers and rich researchable areas; that the previous directors of the unit conducted several basic and applied researches, but only two were presented in a research symposium; many experimental researches were conducted but were not properly documented and completed; funding was insufficient; the administration and faculty members have concentrated more on instruction, production and extension thereby neglecting research. Only three out of the 218 faculty members were actively involved in research. Findings also revealed that research proposals were not subjected to panel or audience for critiquing.
Very few research proposals were processed and completed. It was also found out that for the first 15 years of operation of the unit, only three R&D agenda were set: agricultural development, home technology and agricultural education. Thus, the research function was not able to cater the entire needs of the College particularly the faculty members and the community. The direction of the unit was vague and funding was very scarce.

**Joining the Loop: The Conduct of Research Capability Building Seminars and Workshops**

The conduct of research capability building seminar workshops (RCBSW) was planned and implemented to solve the problems of low profile and interests along research function. Prior to 2003–04, RCBSW conducted were limited to (i) research agenda setting, (ii) identification of research problems and (iii) research format. Only those who had interests in the field joined the research capability building. With this situation, not many were convinced and motivated to conduct researches. Many would see research as a tedious and unrewarding job.

In 2006, one of the policies of the College was to require all faculty members with a rank of Assistant Professor up to conduct researches related to the field of their specialization hence they were obliged to undergo RCBSW to prepare them for the job. At the start, there was some animosity on the part of the faculty maybe because they had not yet fully realized the value of research. In the middle part of 2007, the RDE unit conducted an area scanning among the institutes in the main campus and the eight campuses of RSC. Findings revealed that the faculty members were passive towards research activities because they lacked the knowledge and skills in the conduct of research. This was where the PHILARM and STARRDEC came to the picture.

**R&D Agenda Formation and Program Prioritization.** The collaborative activity on RCBSW was sponsored by the two organizations on May 4–5, 2008. The first was the R&D Agenda Formation and Program Prioritization followed by the formulation of the RDE Manual and the Organizational Set Up. Policies and procedures were presented, discussed and finalized. One of the outputs in the RCBSW was the formulation of the Annual Performance Target based on the results of the R&D agenda setting. Few months later, the RCBSW was replicated in different campuses.

**Research Proposal Writeshop.** The next phases of training assistance given by PHILARM, STARRDEC and CHED-UPB-ZRC came last August 25–26, 2008, where they facilitated a Research Proposal Writeshop con review. This
was participated in by all research coordinators and selected researchers from the five institutes in the main campus and the other eight campuses of the RSC system. In this activity, all participants were required to write and present their research proposals for critiquing and evaluation in front of panelists coming from the pool of experts from different government and non-government agencies. The Vice President and Director of the RDE Unit and the facilitators were part of the panel.

National Environmental Summit. In the same month, the RDE Unit spearheaded the first ever national research event hosted by the College, the National Environmental Summit. The summit featured Paper Presentation, Symposia, Ugnayan at Talakayan sa Isyu ng Pagmimina, Essay Writing and On-the-Spot Poster Making Contests. The activity was in collaboration with the DENR, DA, DOLE, DOST, DTI, STARRDEC, PHILARM, CHED-UPLB-ZRC, NGOs, SUCs and LGUs. The theme centered on: “Enhancing Sustainable Agriculture, Economic and Environmental Development Through R & D Initiatives.” The Summit made an indelible mark in the R&D aspect of the College because there were six researchers from RSC who presented their papers and three of them were adjudged as first, second and third in the Environment and Sustainable Development Category. The participants came from SUCs, NGOs, the religious sector and private institutions from different regions. Twenty eight papers were submitted for presentation and 16 were chosen and presented. The activity boosted the morale of the local researchers. Many faculty members showed interest in RDE after that experience because local presenters were given plaque of recognition and cash incentives by the College President. This ignited the enthusiasm of many faculty members to engage in research. Majority of the faculty members witnessed the presentation which made them realize that they, too, had potentials of their own.

IBA Research Symposium. A month after (October 3–4, 2008), the Institute of Business and Accountancy initiated the first Research Symposium on the institute level. They highlighted presentations of eight papers relevant to the theme “Cultivation of Research Culture Towards a State of the Art Business Education.” This was participated in by amateur researchers from other institutes and campuses. The highlights of the papers presented were released in monographs and journals. After this experience, they gained confidence towards research works and were highly motivated to undertake or be a part of a research project.

Going International for the First Time. In the same month, two researchers of the College participated in international conferences on separate occasions, where they presented a paper and a poster, the first
time for the College. This was a bold step towards higher achievement of the RDE unit.

**R&D Initiatives in Full Swing.** Inspired by the events and opportunities, the College administration declared full support to the R&D programs and thrusts, and to the faculty researchers. The RDE team conducted several RCBSWs in different campuses as requested. Various institutes and campuses initiated In-house Reviews. Last February 2–4, 2009, the RDE Center sponsored the Research Capability Building and Agency In-House Review to screen research proposals for institutional funding. Twenty of these proposals were funded by the GAA and three were submitted to DBM for possible financial assistance. Another inspiring event concerning the RDE happened last February 17–20, 2009, where two RSC researchers were accepted to present their papers in the 2nd International Conference of State Universities and Colleges Teacher Educators Association (SUCTEA), held at the University of Rizal System in Morong, Rizal.

Recently, the Romblon State College was one of the eleven research proponents from Regions IV and V, that received a two hundred thousand peso-grant from CHED-UPLB-ZRC to fund its research project. Aside from this grant, four proposals were accepted by various funding agencies like PCARRD, NEDA, RIDA and DA. The releases were programmed for 2009.

Moreover, as the researchers gained confidence through various exposure and capability building, they tried to embrace and promote a culture of research, thus, the research climate in the college has tremendously heightened within a short span of time.

After the conduct of RCBSW and the attendance of research coordinators and researchers in off-campus research capability building, the research climate of the College was strengthened thereby fostering a research culture. This was manifested by the submission of research proposals attuned to the research agenda of the College, the region and the country. The number of active researchers quantum leaped from 3% to 8.72%. These were the faculty members who had actually conducted and presented their outputs in local, regional, national and international conferences. Several research outputs were published as monographs, sporadic papers and journals. These researches were self-financed; others were partly funded by NGOs, NGAs and GAA. The figures show that now there are already 52 faculty members out of 218 who are actively involved in research. Said figures are much higher than the figures prior to 2004.
Table 1a. Number of RCBSWs conducted in the College.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Campus:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute of Business and Accountancy</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Institute of Arts and Sciences</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Institute of Agriculture, Fishery and Forestry</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Institute of Engineering and Technology</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Institute of Professional Studies and Teacher Education</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Science Laboratory High School</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Satellite Campuses:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Andres Campus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Calatראה Campus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cabulutan Campus (RCFF)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sta. Maria Campus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sawang Campus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>San Fernando Campus</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cajidiocan Campus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Institutional Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Agenda Setting</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>In-House Review-Research Proposal</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>In-House-Review-Completed Researches</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Research Proposal Writeshop</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Technical Writing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Rights/Patenting</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Ethics in Research</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Prescribe Research Proposal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Formats</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>RDE Manual, Rules &amp; Procedures</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Workshop on the Preparation of Annual Performance</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Target of RDE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1b. Number of RCBSWs attended off-campus.

<table>
<thead>
<tr>
<th>AY</th>
<th>Total</th>
<th>Off-campus RCBSW</th>
</tr>
</thead>
</table>
| 2004-05   | 2     | • Strengthening Research Capability of Educators, Researchers and Thesis Advisers in Humanities, Social Sciences and Communication-UP-QC  
|           |       | • Statistical Data Processing and Interpretation |
| 2005-06   | 2     | • National Seminar Workshop on Research Education and Development  
|           |       | • 21st Century and Beyond Research Forum-Ramon Magsaysay Technological University |
| 2006-07   | 1     | • Research Capability Enhancement Training Workshop-DOST |
| 2007-08   | 7     | • Technical Report Writing-PCARRD  
|           |       | • Research Symposium-STARRDEC  
|           |       | • Women’s International Conference – Thailand  
|           |       | • Research Proposal Writeshop (4 RCBSWs)  
|           |       | • STARRDEC - 2  
|           |       | • PCARRD - 1  
|           |       | • DA-BAR – 1 |
| 2008-09   | 11    | • Intellectual Property Rights/Patenting  
|           |       | • CHED_UPLB_ZRC Orientation on MOA and Fund Management  
|           |       | • SUCTEA International Conference- URS- Morong, Rizal  
|           |       | • International Research Capability Building – CLSU – Laguna  
|           |       | • Research Proposal Writeshop (7 RCBSWs)  
|           |       | • STARRDEC - 1  
|           |       | • PCARRD - 2  
|           |       | • DA-BAR – 2  
|           |       | • CHED-UPLB-CRC – 2 |

Research proposals submitted and reviewed are prioritized by the RDE Center. Researches with significance to the regional and national agenda are endorsed to various government agencies and to linkages and networks of the College. Some even financed their own projects due to limited budget.
Table 2. Comparison of research information.

<table>
<thead>
<tr>
<th></th>
<th>Before 2003</th>
<th>2004–2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of research areas</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>No. of active researchers</td>
<td>3</td>
<td>52</td>
</tr>
<tr>
<td>No. of research centers</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>

There are now eight areas of R&D at the College. These are the following:

1. Agriculture, Forestry, Fishery and Natural Resources
2. Business, Management and Cooperatives Researches
3. Marine and Freshwater Researches
4. Education, Curriculum, Culture and Sports Researches
5. Socio-Economics, Political Science and Gender Studies
6. Industry and Energy Researches
7. Mining, Ecotourism, and Environmental Researches
8. Information Technology and other Field of Engineering Researches

The rise in enthusiasm and motivations of the faculty researchers paved the way to the creation of new areas of discipline. Originally, there were only three, by 2004–2007 there were already eight. With the varied expertise and the education the researchers finished in graduate studies, new research and research-related centers were established. Five centers have been established recently: the Agricultural Meteorological Station (AgroMet), Banana Tissue Culture and Diagnostic Laboratory, the Romblon Agriculture Technology Center (RATC), the Romblon Center for Kanidugan Studies (ROCKS), and the Organic Vegetable Experimental Station (OVES).

Implementation of Policies, Benefits, Incentives and Motivations

The R&D Office which is tasked to oversee all research programs and projects, policies and guidelines conducted a one-day orientation on the RDE Manual and Research Institutional Format. Procedures were discussed thoroughly. It was made clear that upon notification on the approval for funding, researchers are required to submit their operational plans, conduct their activities and submit their accomplishments. The researchers are required to prepare a publishable copy of the results of their outputs upon incorporating all suggestions for publication. Service credits are given to them as long as their regular teaching load is not lessened. Such is attested by the VPAA. Their works are to be published in the RSC Research Journal and endorsed to refereed
journals. Any approved research that cannot be completed at the approved time frame is to be accompanied with a written explanation which will be evaluated and recommended by the Research Council for another grant in the succeeding year depending on its merit.

The researchers are to be provided with funding after presenting their research output in local, regional and international venues. These will be endorsed by the R&D Office after presenting a letter of acceptance from organizing or sponsoring agencies. Researches that have been completed and published are given two points in the NBC 461. Researches are packaged into matured technologies. The College provides funds for production of flyers, brochures, patenting and copyright applications and processing.

**Linkages and Networks**

During 2004–2009, the College got a substantial number of linkages and networks. Much effort was spent and the initiative was spearheaded by the RDE office and other college offices including the Office of the President and the Office of the VPRDE. The R&D Office has eight international and 45 national and regional linkages thus contributing to the sustained increase in the indicators. The partnerships and collaborations they generated and forged paved the way to a better and sustained performance of the researchers. Highlights included the memberships of RSC to STARRDEC, a regional agriculture consortium, and the Philippine Council For Agriculture Research and Resources Development (PCARRD). PHILARM and CHED-UPLB-ZRC have been very influential in the revitalization of the RDE center of the college. The RCBSW on R&D Agenda Formation and Program Prioritization facilitated by the Dr. Erlinda B. Aromin of PHILARM in collaboration with STARRDEC served as the take off point of the R&D activities of the college. This was followed by the team from DOST that conducted a one-day orientation on funding assistance and grants for qualifiers to their S & T Priority Thrust.

The existence of collaborations between the College and each of the organizations facilitated the fast movement of expertise to and from the collaborators. All started from the spirit of partnership and cooperation which brought the College to join the loop and into global perspectives. With each organization working hand in hand with RSC, the college, which was on the height of working hard for the accreditation of programs and its quest for its university status, benefited a lot. The College passed several evaluation committees, particularly in the RDE aspect and recently has been favorably recommended for university conversion by the
evaluators from the office of the CHED Commissioner, Hon. Emmanuel Y. Angeles.

Table 4. Research linkages and networks of RSC.

<table>
<thead>
<tr>
<th>Links and networks</th>
<th>Office location</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. International</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Australian Agricultural Technology Center</td>
<td>Australia</td>
<td>2000</td>
</tr>
<tr>
<td>2. Intl Timber Trade Organization (ITTO)</td>
<td>Nagoya, Japan</td>
<td>2002</td>
</tr>
<tr>
<td>5. JICA</td>
<td>Japan</td>
<td>2005</td>
</tr>
<tr>
<td>6. Cuban Government</td>
<td>Cuba</td>
<td>2005</td>
</tr>
<tr>
<td>7. Intl Network for Bamboo and Rattan (INBAR)</td>
<td>Beijing, China</td>
<td>2006</td>
</tr>
<tr>
<td><strong>B. National and Regional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. DEPED</td>
<td>Romblon</td>
<td>1983</td>
</tr>
<tr>
<td>2. NEDA</td>
<td>Quezon City</td>
<td>1986</td>
</tr>
<tr>
<td>3. NRCP</td>
<td>Taguig City</td>
<td>1986</td>
</tr>
<tr>
<td>4. Department of Agriculture</td>
<td>Quezon City</td>
<td>1990</td>
</tr>
<tr>
<td>5. DBM</td>
<td>Quezon City</td>
<td>1997</td>
</tr>
<tr>
<td>6. Natural Products Society of the Philippines (NPS)</td>
<td>UP Diliman, QC</td>
<td>1997</td>
</tr>
<tr>
<td>7. STARRDEC-PCARRD</td>
<td>Los Banos, Laguna</td>
<td>1998</td>
</tr>
<tr>
<td>8. BFAR</td>
<td>Quezon City</td>
<td>1998</td>
</tr>
<tr>
<td>9. Cavite State University</td>
<td>Indang, Cavite</td>
<td>2000</td>
</tr>
<tr>
<td>10. DOPT</td>
<td>Bacolod, Metro Manila</td>
<td>2000</td>
</tr>
<tr>
<td>11. PCIEERD</td>
<td>Taguig City, Manila</td>
<td>2000</td>
</tr>
<tr>
<td>13. Agriculture Technology Institute</td>
<td>Quezon City</td>
<td>2000</td>
</tr>
<tr>
<td>14. TESDA</td>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>15. Batangas State University</td>
<td>Batangas City</td>
<td>2004</td>
</tr>
<tr>
<td>16. Mindoro College of Agriculture and Technology</td>
<td>Oriental, Mindoro</td>
<td>2004</td>
</tr>
<tr>
<td>17. Occidental Mindoro National College</td>
<td>Occidental, Mindoro</td>
<td>2004</td>
</tr>
<tr>
<td>18. Palawan State University</td>
<td>Puerto Princesa City</td>
<td>2004</td>
</tr>
<tr>
<td>19. UST</td>
<td>Espana, Manila</td>
<td>2004</td>
</tr>
<tr>
<td>20. De la Salle University</td>
<td>Manila</td>
<td>2005</td>
</tr>
<tr>
<td>21. UP Diliman –NISMED</td>
<td>Quezon City</td>
<td>2005</td>
</tr>
<tr>
<td>22. NIA Reg. IV-B</td>
<td>Metro Manila</td>
<td>2005</td>
</tr>
<tr>
<td>23. KALAH-DAR</td>
<td>Quezon City</td>
<td>2005</td>
</tr>
<tr>
<td>24. Development Academy of the Philippines</td>
<td>Pasig City</td>
<td>2005</td>
</tr>
</tbody>
</table>
Table 4. Continuation...

<table>
<thead>
<tr>
<th>Linkages and networks</th>
<th>Office location</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. National Commission for Indigenous People</td>
<td>Quezon City</td>
<td>2005</td>
</tr>
<tr>
<td>2. Central Phil. University</td>
<td>Iloilo City</td>
<td>2005</td>
</tr>
<tr>
<td>3. University of Northern Philippines</td>
<td>Ilocos Norte</td>
<td>2005</td>
</tr>
<tr>
<td>4. DOLE</td>
<td>Metro Manila</td>
<td>2006</td>
</tr>
<tr>
<td>5. AACCUP</td>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>6. PASUC</td>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>7. STAVE</td>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>8. CHEd-UPLB-ZRC</td>
<td>OVCRE-Los Banos</td>
<td>2007</td>
</tr>
<tr>
<td>10. Local Government Training Research Institute, Philippine Network</td>
<td>Mandaluyong</td>
<td>2007</td>
</tr>
<tr>
<td>11. PUP</td>
<td>Sta. Mesa, Manila</td>
<td>2007</td>
</tr>
<tr>
<td>12. Western Philippine University</td>
<td>Aborlan, Palawan</td>
<td>2007</td>
</tr>
<tr>
<td>13. UCPB-CIF</td>
<td>Metro Manila</td>
<td>2007</td>
</tr>
<tr>
<td>14. DTI</td>
<td>Makati City</td>
<td>2007</td>
</tr>
<tr>
<td>15. Peace and Equity Foundation</td>
<td>Quezon City</td>
<td>2007</td>
</tr>
<tr>
<td>16. AROPAD</td>
<td>Rombion</td>
<td>2007</td>
</tr>
<tr>
<td>17. University of Asia and the Pacific</td>
<td>Ortigas, Pasig City</td>
<td>2008</td>
</tr>
<tr>
<td>18. West Visayas State University</td>
<td>La Paz, Iloilo</td>
<td>2008</td>
</tr>
<tr>
<td>19. FIDA</td>
<td>Quezon City</td>
<td>2008</td>
</tr>
<tr>
<td>20. PHILRICE</td>
<td>Nueva Ecija</td>
<td>2008</td>
</tr>
<tr>
<td>21. OVCRE-UPLB</td>
<td>Los Banos, Laguna</td>
<td>2008</td>
</tr>
</tbody>
</table>

Indicators

As shown by the dramatic change in values and work attitudes towards research work, the performance of the faculty members improved after the series of RCBSW had been conducted to them. The activity created an awareness and provided motivations for them to start and think of research topics in their respective fields of discipline (Table 5). The capability of the researcher was measured through his finished outputs, like research papers or posters presented locally or internationally and the publications of these papers in research journals. There were RSC researchers who were able to present their outputs in Thailand and Japan. Some faculty researches presented their papers in International Conferences held here in the Philippines. Three research proposals have been presented recently at DBM and have been endorsed for funding. Another four proposals have been evaluated and approved for funding by other funding institutions. Fifteen proposals are now funded under GAA. There is a more substantial increase of proposals and GAA funded projects compared to the earlier time frame. The RDE unit already received a Php2.4 million funding.
assistance for R&D and Php 1.4 million for Extension from the Congressional Development Fund for 2009.

Table 5. RSC R&D performance from AY 2003–04 to AY 2008–09.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No. of faculty involved in research</td>
<td>3</td>
<td>18</td>
<td>14</td>
<td>10</td>
<td>28</td>
<td>52</td>
<td>125</td>
</tr>
<tr>
<td>2. No. of researches published in refereed Journals local and international</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>3. No. of research outputs utilized</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>4. No. of research disseminated in symposia, seminars and conferences</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>5. No. of R&amp;D proposals endorsed by DBM for funding</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>6. No. of R&amp;D projects funded by external sources:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. DA – (P3M)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. DOST – (P250,000.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. PEF – AROPAD – (P70,000.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. CHED–UPLB–IRC – (P200,000.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. DTI – (P17,000.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Cong. Madrona’s CDF – (P3.8M)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. No. of GAA and locally funded R&amp;D Projects</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>15</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>8. No. of completed R&amp;D not yet reported and published</td>
<td>5</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>16</td>
<td>20</td>
<td>63</td>
</tr>
<tr>
<td>9. No. of Awards of distinction given to faculty R&amp;D Projects</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3*</td>
<td>3**</td>
<td>11</td>
</tr>
<tr>
<td>a. National - 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. International – 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. No. of R&amp;D reviews, seminars and symposia conducted</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>11. Annual Appropriation (GAA) for Research (in thousand pesos)</td>
<td>145</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>335</td>
<td>511</td>
<td>2,086</td>
</tr>
</tbody>
</table>

Research Results Dissemination and Utilization

The research generated were packaged in forms understood and utilized by the target clients, beneficiaries and end users. From 2003 to
2009, 19 out of 23 or 52.1% were utilized. Flyers, brochures and CDs of the technologies were also distributed to the end users. Other media include the assembly called by the local executives where seminars and workshops were conducted. Furthermore, demonstration of matured technologies was done in the presence of the participants.

People in the countryside were the primary targets of the utilization of matured technologies. Some technologies were adopted for commercialization. The R&D Office and the Extension Services Office of the College arranged with local chief executives and officials on the dispersion of technologies and research findings. Needs assessment data were the bases for the delivery of appropriate technologies and research findings in the countryside. After which, a Memorandum of Agreement (MOA) between the College and the stakeholders were forged. The significant findings of researches and the technologies generated, disseminated, utilized and adopted helped upgrade the living conditions of the people in the countryside of Romblon and neighboring island provinces. Several R&D outputs were utilized to wit:

1. The research output of the Socio-Economic Profiling of the five poorest municipalities in the province of Romblon conducted by the Institute of Business and Accountancy was utilized by the NGOs and LGUs in formulating a five-year Development Plan to help alleviate poverty in the province.

2. The results of the study initiated by the RDE unit on the Plight of Filipino Women in Rural Communities were utilized as bases of the advocacy and program identification of the RWL-KALII.

3. The research outputs on the graduate tracer studies conducted by various institutes served as bases for curriculum revision and program enhancement.

4. The R&D outputs on Environmental Researches resulted to the production of instructional materials for environmental education.

5. The technologies generated on agricultural R&D about Off-Season Vegetable Production Organic Farming, High Valued Vegetable Production, etc. were now adopted by local farmers.

The RDE center had eight programs that served about 2,500 clients through seminars, information dissemination and trainings conducted from 2005 to date. Dissemination of present programs of the College on the utilization of matured technologies was highly commendable. A sample of
matured technologies was popularized locally and nationally consisting of related technologies duly accepted by scientists, researchers, farmers and households.

CONCLUSION

Research capability building activities created a research climate at the Romblon State College. Institutional initiatives along research functions were geared towards faculty motivation to go into research. Interests, enthusiasm and confidence that were established in the faculty members ushered a sustained performance in R&D putting the College in the local, national and international perspectives. Most importantly, the effort expended by the researchers helped win the most sought endorsement by various evaluators for the university conversion of the College. With the scientific generation of information resulting from research findings, the College was able to disseminate, utilize and convince people, particularly in the rural areas, to use local technologies that will surely protect and benefit them. In totality, R&D projects are highly valued when the results are utilized by stakeholders in policy formulation or revision and program prioritization towards sustainable countryside development.

RCBSW is only effective when it is conducted by experts and is based on what the clients really need. It could be instrumental to promote a culture of research when the top and middle managers are good role models. They need to establish their own credibility in terms of R&D achievement before they can make their colleagues follow suit. Their very own performance is more than enough motivation for others to see the value of R&D to their chosen profession, to the organization, to the community, and to the countryside development. However, the importance of merits and incentives to the researchers should not be discounted to sustain their enthusiasm.

Finally, empowered researchers can easily get their research proposals funded. The question of scarcity of funds due to limited GAA seems not to be a major concern. The few thousands from GAA, when spent for a well organized RCBSW, will generate millions if properly mentored.

RECOMMENDATIONS

Linkaging, networking and mentoring of SUCs with well-established R&D centers should be developed. The RCBSW should be based from a scientific diagnosis to be more effective and must be a continuous program. Sufficient funding for R&D centers is indispensable. Everyone is expected to
help source out funds for research by preparing quality research proposals knowing that financial assistance for R&D is all proposal driven.

Different units of the SUCs must be furnished with the R&D performance indicators for them to have a guide in the quest for excellence and relevance in research and development. The administration should assign competent staff with strong team spirit and high sense of professionalism to run the RDE unit. Government agencies must assist and be deeply interested in SUCs in the realization of the R&D functions. There must be a monitoring mechanism in assisting SUCs in order to determine the status and extent of their R&D activities.

REFERENCES

Foja, Alice F. 2005-2008. Research, Development & Extension Unit Annual Reports, Romblon State College, Odiongan, Romblon


Papa, A. 2006. Personal Communications on NBC 461. Special Paper, Cavite State University

Puriran, M.T. V. SUCs Levelling Evaluation, CHED, Pasig City.


Sespene, J. 2004-2008. College Annual Reports. RSC, Odiongan, Romblon

______________ . 2007. RSC Manual of Operations, Odiongan, Romblon

______________. College Code, RSC Odiongan, Romblon
Academe and Community Initiatives: 
An Approach in the Preservation and Management 
of Upland and Lowland Areas in the Province 
of Occidental Mindoro

Arnold N. Venturina and Emelita V. Macadaeg

ABSTRACT

This research was undertaken by the College in response to the global challenges for Sustainable Management of Bio-Resources and Community Empowerment, aligned with the agreement of the College with the National Economic development Authority (NEDA) through the Provincial Development Council to address the prevailing environmental, economic, social and technical problems in the province. Further, the initiatives were anchored on the Research Agenda of the College, the Regional and National priorities in research focusing on natural resources management such as: protection of the environment and sustainability promotion with the following objectives: To consolidate efforts in the establishment of multi-dimensional approaches in rehabilitating, protecting and sustaining the ecosystem; Showcase upland technologies; and Provide alternative mechanisms in the livelihood activities of the stakeholders (Regional Development Goals). The different programs and projects were documented to determine its long term impact to the preservation of the upland, lowland and coastal resources of the province. The involvements of the GOs, NGOs and the affected communities were tapped. Findings revealed that the Initiatives of the college through Experimental Forestry Center, On Site Entrepreneurial Projects as Performance Thesis (OSEPPT), Initiating Sustainable Upland Development Projects and Mangrove Gene Bank Development. The Mangrove Gene Bank Development serves as the ready source of propagules for the coastal communities and NGO’s conducting mangrove areas rehabilitation activities. The

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City

2 Vice President and Research Coordinator, respectively, Occidental Mindoro National College, San Jose, Occidental Mindoro
establishment of Experimental Forestry Center showcased the preservation of different endemic species of flora and upland technologies particularly SALT. The On Site Entrepreneurial Projects as Performance Thesis (OSEPPT) harnesses the skills of the students and provides a source of livelihood after graduation. Moreover, the program showcases the one hundred five (105) successful Projects in the whole province. The Upland Development Projects harnesses the capabilities of the indigenous people in the production, management and sustenance of upland resources through demonstrations of agroforestry projects. Rate of participation and access to the program, economic returns/benefits, availability of the technology, and consideration to the cultural values of the respondents during advocacy and adoption of the program were found significant success indicators.

INTRODUCTION

The 1987 Philippine Constitution advocates state protection and environmental sustainability. Subsequently, the Philippine Environmental Policy or Presidential Decree 1151 is formulated to maintain a condition under which man and nature can thrive in productive and enjoy harmony with each other. In pursuing this policy, it is the responsibility of the government in cooperation with other public and private organizations and entities to use all practicable means, consistent with other essential consideration in promoting the general welfare of the people.

Occidental Mindoro is the 7th largest island described as mountainous with steep slopes to undulating topography, endowed with high endemism of flora and fauna. It has three distinct ecosystems: the upland, lowland and the marine zone.

Upland areas are usually habituated by upland farming communities (FSD, Philippines 1993). These communities cause incessant destruction in the upland areas because of farming system they inherited from their ancestors over the years. At present, the forests cover of the province, as well as, watersheds are continuously disappearing at an alarming rate due to slash and burn agriculture, ill planned development, illegal logging, and overgrazing (Ordonez, 2003).

The economic activities of the Mindoreños for subsistence show detrimental changes in the environment. Existence of business industries that are forest products-based also contributes to the destruction of natural
resources. Continuous extraction of resources in the upland areas reaches the alarmingly level. Degradation taking place from the upland, is affecting the coastal areas through continuous erosion and siltation.

The initiatives undertaken by the academe are all designed to address these issues and concerns. The programs aimed at helping the farmers who are currently engaged in farming activities concentrated in the different ecosystems of the environment.

This research was undertaken by the College in response to the global challenges for Sustainable Management of Bio-Resources and Community Empowerment, aligned with the agreement of the College with the National Economic Development Authority (NEDA) through the Provincial Development Council to address the prevailing environmental, economic, social and technological problems in the province.

Objectives of the Study

1. To establish multi-dimensional approaches in rehabilitating, protecting and sustaining upland, lowland and coastal areas.
2. To consolidate efforts for environmental protection and conservation.
3. Provide alternative mechanisms in the livelihood activities of the stakeholders
4. Showcase upland technologies for the upland dwellers to emulate and learn its long term beneficial effects to the people and environment.

METHODOLOGY

This research used the process documentation approach to collate and compile the turn of events that took place over the years of the program implementation. Triangulation and focused group discussion were used to document, validate and consolidate the primary and secondary data in making this research report.

DISCUSSION

The different programs and projects that were documented in ensuring the long term sustainability of province resources and its impact to the preservation of the upland, lowland and coastal resources of the province are discussed vividly in the preceding section.

1. Forging partnerships with upland communities, NGO’s and LGU’s.
2. Nursery establishment
3. Academe and Community tree planting and reforestation activities in the Experimental Agro-forestry Center of the College
4. Mangrove Gene Bank Establishment
5. Sustainable Upland Development Programs (SUDP)
6. College Experimental Forestry Center (CEFC); and,
7. On-Site Entrepreneurial Project as Performance Thesis.

The Participants

The participants of this initiative are the College, Plan International, Local Government Units, Cooperatives, NGO’s, DENR, DA, BFAR and in partnerships with the identified upland communities.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMNC</td>
<td>provide technical expertise</td>
</tr>
<tr>
<td>Plan International</td>
<td>provide the funding needs of the project</td>
</tr>
<tr>
<td>Indigenous People</td>
<td>Simulation of technology disseminated</td>
</tr>
<tr>
<td></td>
<td>tasked to undertake the actual work implementation of the projects</td>
</tr>
<tr>
<td>Department of Agrarian Reform (DAR)</td>
<td>provide the funding needs for livelihood trainings and workshops</td>
</tr>
<tr>
<td>LGU’s and Cooperatives</td>
<td>Helps in the organization and serves as collaborators in project implementation in their vicinity.</td>
</tr>
<tr>
<td>NGO’s, DENR, DA, and BFAR</td>
<td>facilitate other interventions such as: Linkages with the LGU’s i.e. health programs, cooperative development, etc. Moreover, they also provide technical expertise</td>
</tr>
</tbody>
</table>

Initiatives Highlights and Activities

The initiatives were anchored on the Research Agenda of the College, the Regional and National priorities in research focusing on natural resources management such as: protection of the environment and sustainability promotion with the following objectives:

- To consolidate efforts in the establishment of multi-dimensional approaches in rehabilitating, protecting and sustaining the ecosystem,
- Showcase upland technologies; and,
- Provide alternative mechanisms in the livelihood activities of the stakeholders.
A. Nursery establishment

A nursery was established and maintained through the collection of endemic species like palms (Family Palmae or Poaceae), bamboos, woods, and fruit trees including coconut. These species of plants were propagated and distributed for community mass tree planting involving various stakeholders. The College nursery and botanical garden serves as the propagation sites.

B. Academe and Community tree planting/reforestation and other activities for the environment

1. Mass tree planting activities was undertaken by the students, communities in response to the call of save the planet earth. Every department of the college was required to include this program in their action plans.
2. Clean and Green program is a whole year round activity of the college in different areas within the province.
3. Year round coastal clean up was undertaken by the students, faculty members and the community in the stretch of coastal areas in the province every Saturday.
4. Integration of Environmental Conservation concepts and strategies in the school curriculum such as: Environmental Education (Province wide); Organized cooperatives; conduct seminars and trainings about livelihood, book keeping and marketing among others; and Establishment and monitoring of On Site Entrepreneurial Project as a Performance Thesis (OSEPPPT) throughout the province.

C. Academe Based Mangroves Gene Bank

Presently, the gene bank is already established. There are eight (8) species of mangroves species planted commonly growing in Mindoro. Five of which are trees such as Bakauan-babae (R. mucronata), Bakauan lalaki(R. apiculata), Piapi (A. Alba), Api-api (A. officinalis) and Buta-buta (a. Marina), two species of shrubs such as Tangal (C. Tagal) Buta-buta ( E. agalluchca) and one species of palm such as Nipa.

The different species of mangroves ranges from ten (10) to twelve (12) years old. Collections and propagations of other species are still going on. It is envisioned that other essential species will be collected and characterized to serve as the ready source of propagules in the future undertakings.
D. Showcasing of Agriculture and Agroforestry Farming Schemes through:

1. College Experimental Forestry Center (CEFC);

From the time of acquisition, faculty and students are conducting tree-planting activities annually in the Agroforestry Center of the College. This is done to inculcate the values of conservation and environment protection among the students. The center likewise serves as venue for hands on training and seminar conducted for the students and the community in the field of upland management and farming system.

Combinations of exotic and endemic trees are now planted and growing in the area. Along the plain areas are fruit trees; while on steep slopes are bamboo and forest trees. This was reinforced by the project and activities Showcasing Upland Management in Agroforestry (SUDP) (Calitang, G.L. et al.) as follows:

- Hands-on training of the Agro-forestry students
- Showcasing various types of land management schemes such as:
  - hedgerows,
  - terracing contour canal,
  - cover cropping and
  - use of various types of mulching materials; and
  - Sloping Agricultural Land Technology (SALT)

2. Sustainable Upland Development Program (Orfiano, et.al)

The College is also an advocate of upland management scheme through partnership with NGOs, and Indigenous People Organizations. The Sustainable Upland Development Project for the Buhid tribe (one of Mangyan tribes) is a joint undertaking of the College, Plan International (an International Non-Government Organization) and Indigenous people. Plan International provide the funding needs of the project, while OMNC’s counterpart is to provide technical expertise, the indigenous people on the other hand are tasked to undertake the actual work implementation of the projects. The project will be undertaken in five (5) years.

E. On Site Entrepreneurial Project as Performance Thesis (OSEPPT) (Venturina, Agriculture Department)

One of the important features of the Agroforestry Program of the College is the inclusion of an “On Site Entrepreneurial Project as Performance Thesis (OSEPPT). In this program, there is a minor deviation from the
standard agroforestry curriculum offered by Agricultural State Colleges and Universities in the country. It is an alternative course program for customary research writing, otherwise known as thesis. Thesis is replaced by OSEPPT for those students who opted to pursue the latter. The students in their respective farms and communities implement OSEPPT with the following provisions:

1. Students are given the options to put up an agroforestry projects in their respective farms (half a hectare or more).
2. Adapt different concepts and principles of agroforestry in the implementation of the projects.
3. A committee monitors and evaluates the project.
4. Present OSEPPT output before a panel that will rate and evaluate the results of the project.
5. After ten years of implementation, there are one hundred five (105) agroforestry projects scattered in the whole province of Occidental Mindoro and part of Oriental Mindoro.
6. These projects serve as tangible output for stakeholders to have paradigm shift in their farming system.
7. Projects
   - agroforestry,
   - silvopastural,
   - banana, and mango intercropping schemes
   - multistory Scheme of Planting
   - SALT / sloping agricultural land technology

**Monitoring and Supervision**

During the implementation of the program, the RD&E of OMNC-Main Campus will closely monitor and supervise the scheduled activities. Likewise, a scheduled monitoring and evaluation was conducted as to the feasibility of the different project.

When the projects are already operational, the lead agency will further supervise as to the production aspect to further improve the projects of the beneficiaries. If there is still a need for further skills training, it will be provided by the college and other concerned agencies.

The monitoring activities were done for three years to ensure that all technical problems that will arise could be addressed accordingly.

**Project Turnover**
After two years of operation, the project will be turned over to the concerned beneficiaries including the responsibility on the regular monitoring and evaluation. However, the lead agency, OMNC, will still conduct a yearly monitoring and evaluation on the sustainability of the projects.

**IMPLICATION OF THE PROGRAMS IMPLEMENTED**

**New Direction is Set for the Environment**

The academe and the community initiatives provided better direction and alternative towards more sustainable practices. The introduction of an environmental framework leading to the achievement of environmental awareness, new concept of farming systems pave the way to the development of this community initiatives. The activities conducted through the research unit of the College; the technologies developed were disseminated to the community.

**Collaboration is Enhanced**

Participation/Cooperation of the different stakeholders is revitalized through partnership with the government and non-government agencies were conducted. The involvements of the GOs, NGOs and the affected communities were tapped. The services to the people were provided and eventually led to the development, protection and management of the different ecosystem from the upland down to the marine zone.

**Gene Bank Establishment**

Mangrove Gene Bank Development serves as the ready source of propagules for the coastal communities and NGO’s conducting mangrove areas rehabilitation activities.

**Farming System Models**

The establishment of the College Experimental Forestry Center showcased the preservation of different endemic species of flora and upland technologies particularly SALT.

The Sustainable Upland Development Program harnesses the capabilities of the indigenous people in the production, management and sustenance of upland resource through demonstrations of agroforestry projects.
The On Site Entrepreneurial Projects as Performance Thesis (OSEPPT) harnesses the skills of the students and provides a source of livelihood after graduation. And showcases the one hundred five (105) successful projects in the whole province. The graduates of agroforestry course of the Occidental Mindoro National College are now serving as the conveners of forestry technologies in the province through OSEPPT.

**Sustainability of the Programs**

Community Involvement is intensified due to the following parameters:

- **Cultural Acceptability** was measured according to the 1) Active participation to Meetings Conforms with the Sentiments and Aspiration of the People; 2) The program’s conformity with the cultural values, Beliefs and Rituals e.g. IPs; and their 3) Willingness to be organized

- **Socially Just (Observations)** 1) Equal access to the program; 2) Cooperation to the activities; and 3) Satisfied with the introduced program

- **Technological Adoptability** 1) Conforms with knowledge of the beneficiary; 2) Easy to follow or adopt; and 3) Combination of Institutionally Organized Knowledge System (IOKS) and Indigenous Knowledge System (IKS) made a difference in the technology promotion

- **Economic Viability** Capability of the program to provide such as: 1) Food for the Households; 2) Other materials needed by the family; 3) additional income; and 4) Alternative livelihood

- **Ecological Friendliness** of the Program 1) Maintain the productivity of the area; 2) efficient control of soil erosion; 3) Effective soil fertility management; and 4) Preservation of Endemic Species

**LESSON LEARNED**

**Issues and Problems Encountered**

- Lukewarm Participation/Cooperation
- Poverty and Environment
- Programs Sustainability
- Population Increase and Sources of livelihood
- Clear cut delineation of jurisdictions
- Overlapping programs
Program implementation is effective when:

- The program will consider the cultural values of the people
- Stakeholders are given access to have active participation in the program
- Satisfied with the introduced program
- Conforms with knowledge of the beneficiary
- Easy to follow or adopt

Program for the Environment is Effective when:

- the program conforms with the culture of the people
- the technology involved is within the knowledge system
- the affected community will be provided of an equal access to the services of the government
- there is a strong linkage between the community and initiator of the program

Rate of participation and access to the program, economic return/benefit, availability of the technology, and consideration to the cultural values of the respondents during advocacy and adoption of the program were found significant success indicators.

**Recommendation/Insights**

1. Academe and Community Initiatives should be strengthened for the environment
2. Involvement of the concerned community in all environmental undertakings should be intensified to ensure success of the program.
3. Other agencies initiating environmental programs should encourage a multi level participation of the stakeholders.
4. Similar undertakings should be undertaken in the community.

**Institutional Benefits from the Program**

- Awards and Recognition
- Annual Performance Rating by the DBM
- Income generating projects
- Related Learning Experiences
REFERENCES


Forging Partnership with the Indigenous People in the Poverty Alleviation Promotion thru Environment and Livelihood Program for the Buhids (Papel Buhid): The OMNC Experience

Susanita G. Lumbo 2, Nelson A. Orfiano, Garry L. Calitang 3, Arnel A. Magarro 4, Venessa S. Casanova 5, Jerardo A. Camus 6, and Nena L. Pajarillo 7

ABSTRACT

The Poverty Alleviation Promotion through Environmental and Livelihood Program for the Buhids (PAPEL Buhid) is an extension program initiated by the Occidental Mindoro National College (OMNC) and the Buhids of Bato-ili. It is a five-year program launched in December 2006 designed to help in the rehabilitation and conservation of upland resources and in the generation of sustainable livelihood of the Buhids. It specifically aims to improve agricultural production and health condition in the uplands, promote adoption of appropriate upland technologies, and introduce sustainable livelihood using locally available resources.

The partners in the PAPEL Buhid Program are the Mangyans of Bato-ili, OMNC, and Barangay Council of Monteclaro. Other agencies helping the program are the Department of Education, Department of Environment and Natural Resources, National Commission for the Indigenous People, Plan San Jose, Habanan Buhid, and Catholic Mangyan Mission.

The making of the PAPEL Buhid included the project

---

1 Paper presented during the 19th PHLARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Associate Professor IV, Occidental Mindoro National College, San Jose, Occidental Mindoro
3 Instructor I, Occidental Mindoro National College, San Jose, Occidental Mindoro
4 Assistant Professor I, Occidental Mindoro National College, San Jose, Occidental Mindoro
5 Instructor III, Occidental Mindoro National College, San Jose, Occidental Mindoro
6 Instructor I, Occidental Mindoro National College, San Jose, Occidental Mindoro
7 Assistant Professor I, Occidental Mindoro National College, San Jose, Occidental Mindoro
conceptualization, conduct of consultation meetings with instructors and students, creation of ad-hoc committee, consultation with stakeholders, identification of gatekeepers and potential partners, identification of final partners, and planning with partners.

Strategies of implementation included conduct of a participatory rapid appraisal (PRA), planning and strategizing, continuing education, identification of livelihood programs, and monitoring and evaluation.

The problems encountered included the following: the erratic schedule of the major stakeholders. The availability of the OMNC RDE staff oftentimes does not match with that of the Mangyans. They are most of the time available during the night only since they are on their farms at day time. To address this, OMNC staff slept in the village and conducted consultation meetings in the evening until the wee hours of the morning. There was the gatekeepers' prominence in the decision making of the Mangyans. Their approval is often sought to ensure the IP’s active participation. Lack of sincerity of some stakeholders; the tendency of some Buhid leaders to grandstand and dominate fellow Buhids; and adherence to traditional beliefs prevented the full cooperation in the development activities. Regular dialogue, conscientization, and reorientation of values were conducted to help the Buhids make decisions.

It was found that forging partnership with the Mangyans or any group of individuals is easier when the idea came from them especially when the need arises from their felt needs and priorities. Respect of their culture and uniqueness help build trust and confidence with the partners. The Mangyans are willing to actively participate when there is transparency in all transactions made especially those that require money. This means that they should be involved in all management aspects of the program. The program has improved the social relations among the Buhids and has helped build their trust in and confidence with the stakeholders especially the OMNC. It has also helped them get access to other social services and institutions.

It is recommended that in order to contribute significantly in uplifting the lives of the Manyans especially in Bato-ili, there is a need to introduce more feasible livelihood projects; to
conduct continuing education until the Buhids realize their full potential; and to strengthen existing linkages and invite other agencies to join in the development efforts.

RATIONALE

The Occidental Mindoro National College (OMNC), the lone state college of Occidental Mindoro envisions to become an active instrument in the promotion of sustainable programs through its mandated functions – research and extension.

The College, recognizing some limitations especially in terms of financial capability to initiate development programs, believes that it can only realize its vision when it forges partnership with other organizations sharing similar vision.

The institution has been working in partnership with various development organizations in initiating programs that promote sustainable farming technology particularly in the uplands. The OMNC has recognized its significant role in taking into consideration the special needs and situations of the upland dwellers especially the Mangyans whose communities are situated within the periphery of the OMNC Murtha Campus. It strives to contribute in the improvement of the indigenous peoples’ (IP’s) quality of life by actively working with them through programs that promote and restore the environment. The Poverty Alleviation Promotion through Environment and Livelihood Program for the Buhid Mangyans is one of the extension programs of OMNC designed to help the Mangyans attain better quality of life.

The Mangyans are the Mindoro’s poorest of the poor. Their landholdings are generally sloping and because of the non-environment friendly farm practices including the slash-and-burn method of cultivation; the quality of soils has degraded and has greatly affected land productivity. This phenomenon has aggravated poverty among the Mangyan communities.

Objectives

The program is designed to contribute in uplifting the quality of life of the Buhids through their active participation in the rehabilitation and conservation of upland resources and in the generation of sustainable livelihood.
The specific objectives are:

1. To improve agricultural production and health conditions in the community.

2. To promote adoption of appropriate upland farming technologies.

3. To introduce sustainable livelihood using locally-available resources.

METHODOLOGY

The Making of PAPEL Buhid Program

Conceptualization of the Program. Working with the Buhids in Sitio Bato-ili through the various extension activities started in 2004 when the Agriculture Department conducted training on sloping agricultural land technology (SALT) in the village. Mr. Claudio Espiritu, a respected member of the tribe and then a senior Agriculture student facilitated the said activity. The activity was an offshoot of the agroforestry model farm established by Claudio in the village as his On-site Entrepreneurial Project as a Performance Thesis (OSEPPT). The Buhids were inspired by Claudio’s project and they wanted to learn more about its components. In March 2006, the Department did a follow-up training on vermi-composting technology and fruit tree planting. This was made possible through the help of Catholic Mangyan Mission and Monteclaro Barangay Council. Since then the Agriculture Department had maintained a cordial relationship with the villagers and the local leaders.

The Buhids heard about the Sustainable Upland Development Project (SUDP) initiated by OMNC and Plan San Jose in Sitio Salafay of Barangay Monteclaro – a settlement of their fellow Buhids. They wished that a similar project is established in their area. They asked the OMNC students they had befriended during the previous activities if it is possible that the Institution could help them in their environmental and livelihood concerns. The students brought this matter to the attention of their instructors.

Conduct of Discussions with Instructors and Student Organization. The decision to accommodate the invitation of the Buhids was made after having a series of informal discussions with some agro-forestry faculty and officers of the Agro-forestry Students’ Society (AFS). On the part of the students, they wanted to pursue the program to make it a venue for their On-Site Entrepreneurial Project as a Performance Thesis (OSEPPT) and a community project of the AFS. For the instructors, it could serve as the...
Agriculture Department’s extension program and a laboratory for the agro-forestry, extension and community organizing subjects.

Creation of Ad-hoc Committee. Not all agro-forestry instructors were involved in the program. Instructors who would compose the Ad-hoc Committee were identified based on their field of specialization, interest, and willingness to work beyond office hours and working days. Seven instructors whose specializations included extension education, forestry, animal science, agronomy, food technology, and general education agreed to join the group. These instructors became the proponents of the PAPEL Buhid.

Tasks were distributed such as consultation with stakeholders, identification of gatekeepers and potential partners, sourcing of funds, and community mobilization. Officers of AFS acted as support staff of their instructors.

Consultation with Stakeholders. A series of consultation meetings with the tribe leaders and barangay officials was conducted starting August 2006. Initially, the barangay captain was reluctant to participate in the proposed program explaining that similar interventions were already introduced in the community in the past but everything failed because the Buhids did not cooperate. After explaining to her the circumstances that led to the conceptualization of the program, she finally approved it and promised to give her usual support and cooperation.

Identification of Gatekeepers and Potential Partners. Although the Buhids did the invitation to help them in their development activities, they advised OMNC to seek first the blessings of certain individuals and groups especially the Catholic Mangyan Mission. This is the most influential group followed by the Panlalawigang Samahan ng mga Katutubong Mangyan sa Kanlurang Mindoro (PASAKAMI) and Habanan Buhid—a federation of Buhids from different communities like Bato-ili, Salafay, Balingaso, Danlog and others.

Aside from the LGU, the National Commission for the Indigenous People (NCIP), Plan San Jose (formerly Plan International) and the Department of Education (DepEd) were identified as gatekeepers and potential partners. Meetings with these groups were done in their respected offices.

Identification of the Final Partners. The organizations that expressed willingness to help OMNC in the implementation of the program were the Barangay Council of Monteclaro and the Buhid Mangyan Community of Bato-ili. The Plan, NCIP, and Catholic Mangyan Mission also promised support for the success of the program. Plan gave PhP25,000.00 for the conduct of
initial activities including participatory rural appraisal.

Planning with Partners. After the partners had been identified, the Buhid leaders, the Barangay Council of Monteclaro and the OMNC proponents met at the barangay hall of Monteclaro to discuss matters regarding the implementation of the program. It was during this occasion that the Program was named PAPEL Buhid.

Program Launching and Signing of the Memorandum of Agreement (MOA). PAPEL Buhid was launched on December 16, 2006 but the signing of the MOA took place a year after during the project’s first anniversary celebration. These occasions were successful in terms of attendance of prominent people in the community, stakeholders and partners.

Strategies Employed in the Implementation of PAPEL Buhid

In the implementation of the PAPEL BUHID Program in Bato-iii, the following were done:

Conduct of Participatory Rapid Appraisal (PRA). PRA was conducted to assess the situation of the Buhids in terms of constraints and problems encountered in identified areas such as agriculture and livelihood, institutions, environment, health, education, and gender; to examine past development efforts made in Bato-iii; and to determine the factors that maintain, increase, or eliminate problems.

Using the participatory approach, the Buhids were allowed to define their goals, needs and aspirations and how they could realize these. They identified poor health, low farm productivity and income, poor soil quality and land erosion as the most pressing problems affecting the community.

Planning and strategizing. Immediately after conducting the PRA, planning and strategizing were done. The initial output was a one-year action plan of the PAPEL Buhid. The specific activities, persons/agencies involved, resources needed and expected date of accomplishment were deliberated. The action plan served as the blueprint of all activities conducted during the first year of program implementation.

Continuing Education. Conduct of a series of seminar/workshops to reorient their values regarding self-reliance, self-worth, and community development was done. These were performed with extra care as the Manyans have distinct culture. Livelihood trainings were conducted to equip them relevant knowledge and skills needed in attaining the goals that they have identified during the PRA.
Identification of Livelihood Projects. Using the PRA results, the different livelihood projects were identified taking into account the availability of local resources and sustainability. This was to ensure that the programs address the felt-need of the community.

Monitoring and evaluation. Regular program monitoring was done quarterly and as need arises. Every monitoring activity, the partners were represented to discuss matters needing urgent actions or solutions.

RESULTS AND DISCUSSION
Projects implemented

The following projects and activities were established and conducted on the first year of the program. These were designed to address the most pressing problems that they have identified such as poor health, low farm productivity and income, poor soil quality and land erosion.

1. Community nursery for forest and fruit-bearing trees and herbal plants. The seedlings produced by the nursery were utilized by the Manyans in greening and beautifying the surroundings of the Bato-ili Minority School. Fruit and forest tree seedlings were planted in their individual farms. The herbal plant nursery was the chief source for medicinal plant needs of the community.

2. The Mangyans established a vegetable garden in the backyard. They enclosed it with a fence to prevent the entry of backyard animals like pigs, chicken and goats. Some households also grew ornamental plants in the backyard.

3. Mahogany and banana plantation. This was established near the water tank area that is barren but enclosed with a cyclone wire.

4. Landscaping and beautifying of the minority school premises. Cleanliness and sanitation had improved in the community. Indicators were the pupils who come to school clean and well-groomed and observance of proper waste disposal within the village.

5. Livelihood trainings on handicraft, organic fertilizer production, seedling grafting, and practical cooking. The compost produced was utilized as a planting medium for the growing of seedlings. The women were trained on healthy cooking procedures to ensure that children get good nutrition out of the food available in their midst.
6. Seminar on health and nutrition, prevention of family or community diseases, parenting, and values orientation.

7. Jingle making and singing contest for the Buhid school children in Bato-ili. This was a form of environmental conservation campaign. The DepEd helped in making this campaign a success.

Problems Encountered and Actions Taken

The erratic schedule of the major stakeholders was quite a problem in the course of program implementation. The availability of the OMNC RDE Staff oftentimes does not match with that of the Mangyans. The Mangyans most of the time are available during the night only since they are on their farms at day time. Their farms are allocated 4-6 kilometers from their village. To address this, OMNC staff slept in the village and conducted consultation meetings in the evening until the wee hours of the morning. Whole day activities were scheduled in consideration with their village calendar of activities.

The gatekeepers' approval in the decision making of the Mangyans is still very strong. Although their approval of the program was sought already during the planning stages, from time to time the Buhids would ask if their caretakers (Catholic Mangyan Mission) and elders (Gurangons) are informed. To address this problem, the proponents always see to it that the elders and any staff of the Catholic Mangyan Mission are present during the activities.

There was lack of sincerity among some stakeholders. Ningas cogon syndrome impeded smooth operations of the project. The Buhids pastured their goats inside the mahogany and banana plantation, thus most of the trees were destroyed. The screen cover of the nursery was missing. Constant holding of dialogues and social activities that included little drinking and eating helped address the problem. Continuing education was found necessary also. There should be constant efforts to let the Mangyans feel and realize that all projects are their own and therefore, they should take good care of them.

It was observed that some young Buhid leaders tend to grandstand and dominate fellow Buhids. This is especially true with the Mangyans who have experienced doing community development work. The people still listen to the gurangons if ever there are conflicting ideas. In order not to disappoint everybody the young leaders are given important tasks in the activities approved by the gurangons.
The strong adherence to traditional beliefs prevented the full cooperation of the Mangyans in the development activities. Regular dialogue, conscientization, and reorientation of values were conducted to help the Buhids make sound decisions.

CONCLUSIONS AND IMPLICATIONS

1. Forging partnership with the Mangyans or any group of individuals is easier when the idea came from them especially when the need arises from their felt needs and priorities. Respect of their culture and uniqueness help build trust and confidence with the partners. This will ensure success of any endeavor. Similarly, success of any development program does not depend on the availability of funding alone but on the sincerity and willingness of the partners to go beyond the comfort zone.

2. While the Manyans are always skeptical of the real intention of individuals and organizations coming to their community to help, they are willing to actively participate when there is transparency in all transactions made especially those that require money. This means that they be involved in all management aspects of the program.

3. The program has improved the social relations among the Buhids and has helped build their trust and confidence with the stakeholders especially the OMNC. It has also helped them get access to other social services and institutions. This trust and confidence must be nurtured to ensure sustainability of the program and success of future efforts even after PAPEL Buhid is terminated.

RECOMMENDATIONS

The following are recommended in order to contribute significantly in uplifting the lives of the Manyans especially in Bato-ii:

1. Introduce more feasible livelihood projects.

2. Conduct continuing education until the Buhids realize their full potential.

3. Strengthen existing linkages and invite other agencies to join in the development efforts.
REFERENCES

BAT Workbook in Social Science IV (Community Organizing and Cooperative Development) . AGRITECH

Calub, Blesida M. “Enhancing the Adoption of Agroforestry Technologies”. In: Abstracts of Researches on Soil and Water Conservation in the Philippines. Department of Social Forestry and Forest Governance, UPLB, College of Laguna, Bureau of Agricultural Research, Department of Agriculture, Diliman, Quezon City and Bureau of Soils and Water Management, Department Of Agriculture, Diliman, Quezon City. 2002.

Chiong-Javier, Ma. Elena. “Agroforestry Intervention among the Hanunuo: Lesson for Program Development”. In: Abstracts of Researches on Soil and Water Conservation in the Philippines. Department of Social Forestry and Forest Governance, UPLB, College of Laguna, Bureau of Agricultural Research, Department of Agriculture, Diliman, Quezon City and Bureau of Soils and Water Management, Department Of Agriculture, Diliman, Quezon City. 2002.


Exploring Opportunities for Farmer-Led Research and Development: The Cavite State University Experience

Divinia C. Chavez 2, Edna DA. Vida 3, Teddy F. Tepora 4, Fatima C. Ilagan, Enrica C. Esmero 5

ABSTRACT

It has been quite clear for development workers and organizations alike that the orthodox, technology transfer-oriented type of extension work has failed to promote rural development in most parts of the world. Experiences in development work bore witness to agricultural technologies, techniques and practices that were eventually deemed inappropriate at the local level, all because local farmers were not consulted and/or trials were not conducted at local farms. Thus, institutional arrangements are constantly being sought for to foster enhanced sustainability, increased participation, and the incorporation of indigenous knowledge and practices.

Along this line, farmer-led approaches have been found to be effective in integrating research and extension activities, as well as in merging the knowledge and research capacities of both local communities and research and development organizations, in a cooperative learning process. These are done with the aim of strengthening local capacity for experimentation and to reinforce the adoption of new technology, as well as its dissemination.

The Cavite State University, in cooperation with other research and funding agencies, has initiated its own farmer-led research efforts. Specifically, it has identified farmer-scientists

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 President, Cavite State University, Indang, Cavite
3 Director for Research, Cavite State University, Indang, Cavite
4 Director for Extension, Cavite State University, Indang, Cavite
5 Faculty Researcher, Cavite State University, Indang, Cavite
from the group of local farmers, to be trained and developed in scientific techniques and new technologies.

The University has witnessed the development of the farmer-scientists that it has identified and developed, particularly that of Mr. Eddie Silan, who eventually gained international recognition as a model banana farmer. His farm continues to serve as a model farm for various commodities, such as banana, dragon fruit and papaya, as well as various vegetables. Moreover, he continues to conduct his own research and experimentation activities, as part of his efforts to develop his own innovative agricultural techniques and technologies.

Process documentation was conducted to record the development of Mr. Silan.

It was found that the potential of farmers for research and experimentation could easily be developed if provided with the appropriate support from academic, research and funding institutions.

The results validate the potential of farmer-led research and development as a tool in bringing about rural development.

INTRODUCTION

Development workers and organizations alike have always strived to uplift the quality of life of people in rural areas, especially in farming communities. However, some have reported to have failed in attaining this goal for a number of reasons. These include the inappropriateness of the technologies or techniques being disseminated to local conditions, lack of consultations with the farmers concerned and lack of field trials at local farms. Therefore, new types of institutional arrangements are constantly being sought for to foster enhanced sustainability, increased participation, and the incorporation of indigenous knowledge and practices.

Farmer-led research and development was found to be one of the answers to this problem. This approach was also deemed to be necessary because of the wide range of ecological, climatic, economic and socio-cultural conditions, and the varied types of farming systems require locally-
specific practices or methods. Moreover, rapidly changing conditions also require local capacities to be able to adapt quickly.

In line with this, farmer-led research and development have been found to be effective in integrating research and extension activities, as well as in merging the knowledge and research capacities of both local communities, as well as research and development organizations, in a cooperative learning process. This includes the identification, generation, evaluation and adoption of new techniques and practices.

Rationale

The Cavite State University (CvSU), in cooperation with other research and funding agencies, namely the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) and the International Network for the Improvement of the Bananas and Plantains (INIBAP), has initiated its own farmer-led research efforts. Specifically, it has identified potential farmer-scientists from the set of local farmers to be trained and developed in scientific techniques and new technologies. These efforts have produced farmer-scientists or mga magsasakitang siyentista who eventually became recognized experts in their commodities and who, more importantly, were able to come up with their own agricultural innovations that improved farm productivity and income. Also, they were also known to have profound impacts on their fellow farmers, researchers, academicians, their respective communities, and the nation as a whole.

The University is located in the province of Cavite, which is situated in the southwestern part of the Metro Manila area. The province's terrain is subdivided into three types, namely the lowland, the rolling and undulating central portion, and the upland. The lowland part is now fast becoming a site for industrial zones, such as the First Cavite Industrial Estate (FCIE) and the Cavite Export Zone (CEZ) in Dasmarinas and Rosario, Cavite, respectively. The central portion and the uplands on the other hand, comprising about 72% of the total land area of the province, has remained devoted to agricultural production.

Meanwhile, banana is one of the main crops produced in the province and is supplied mostly to Metro Manila. However, there was a decline in production in recent years, due to the presence of the banana bunchy top virus (BBTV) disease. The BBTV is one of the most destructive diseases of banana from 1923 to 1940, which destroyed the banana industry in Cavite in 1940 (Magnaye, 1985).
The traditional way of using the suckers as planting materials contributes to the recurrence and spread of the disease. With the introduction and use of tissue-cultured planting materials, the disease could now be reduced, if not totally prevented.

The International Network for the Improvement of the Bananas and Plantains (INIBAP) has been establishing linkages with government and non-government agencies for the rehabilitation of the banana industry nationwide and providing free tissue-cultured banana seedlings of different introduced resistant varieties to be tested in the farmers’ field. As an agency engaged in research and extension, CvSU has tied-up with the INIBAP to rehabilitate the banana industry in the province of Cavite in 2002. The project primarily dealt with the performance evaluation of the introduced varieties, comparing them with the traditional varieties.

The project also involved selected farmer-cooperators who were provided with trainings, taught new technologies, provided access to improved varieties and technical assistance by CvSU and the INIBAP. Those with high potentials good research skills were eventually tapped to become a farmer-scientist or magsasakang siyentista for succeeding linkages with other agencies.

Foremost among the identified farmer-scientists is Mr. Edilberto Silan, who has gained both international and national recognition as a model farmer in banana, dragon fruit, and other commodities. This paper focuses on the development of Mr. Silan as a farmer-scientist, as a result of the knowledge that he has gained, as well as with the linkages that he has established as part of the affiliations initiated by CvSU with other agencies.

Objectives

The main objective of this study is to describe the development of the identified farmer-scientists in terms of conducting their own research activities and being innovators, specifically that of Mr. Edilberto Silan, after taking part in the linkages initiated by the University.

Specifically, the study aims to accomplish the following:

1. Describe the activities where Mr. Silan took part in as a farmer-scientist, especially the farming innovations that he has developed.

2. Identify the achievements and awards received by Mr. Silan as a farmer-scientist.
3. Recognize the different impacts brought about by Mr. Silan’s accomplishments and activities to the local community and other sectors.

CONCEPTUAL FRAMEWORK

![Conceptual Framework Image]

Figure 1. Conceptual framework of the study.

Figure 1 shows the conceptual framework of the study. The efforts of both the academic institution and the farmer are used to sustain farmer-led research and development programs/projects. These programs and projects in turn, bring about changes in the social, economic, political facets of the community, while doing the same for the knowledge, attitudes and practices of the farmers and residents concerned. As a consequence, all these changes act as a catalyst in improving the lives of the community residents, as well as that of the other sectors concerned.

METHODOLOGY

Process documentation was conducted to record the development of Mr. Eddie Silan as a farmer-scientist. Field visits and interviews were carried out to gather information and verify secondary data. Participant observation was likewise conducted during activities and events that involved both Mr. Silan and representatives from the University.
DISCUSSION

Cavite State University (CvSU) began its involvement with farmer-led research and development when it took part in a nationwide program for the rehabilitation of the banana industry with INIBAP in 2002. The project involved selected farmer-cooperators from the area, who were willing to share their time and effort for the venture. Those who performed well and showed promise for research and experimentation during the project were identified as potential farmer-scientists for future programs/projects with other agencies.

One of the farmer-cooperators who took part in the project with INIBAP was Mr. Edilberto Silan. As a farmer-cooperator, Mr. Silan agreed to devote a total of 1.5 hectares of his farm to varieties propagated by INIBAP and the local Bungulan and Lakatan varieties for comparison. He planted one hectare in the open field and 0.5 hectare intercropped with coconut trees.

Mr. Silan remained active in propagating tissue-cultured banana long after the project with INIBAP was concluded. He was likewise continuously engaged in the production of other high value commodities such as dragon fruit. His active involvement in farming activities extended beyond his farm, and in May 2005, he co-founded the Cavite Modern Growers, and became its first President. This farmers’ organization, which started with a membership of 200, now has more than 1,200 members to its name. The organization’s members soon became advocates for using tissue-cultured banana seedlings as planting materials.

At this point, Mr. Silan began gaining recognition for his achievements in farming. On August 15, 2005, he was appointed Farmer-Scientist for S&T Farms on Banana by PCARRD and CvSU. As such, he has been regularly sharing his expertise in banana farming to other farmers, practically acting as a consultant in the field. His farm was likewise acknowledged as a model farm for banana, and has been receiving both international and local visitors on a regular basis ever since.

Mr. Silan was also invited to share his expertise on the production and propagation of tissue-cultured lakatan during the “Technology Clinic for Banana Growers,” held by the Extension Services unit on August 19, 2005.

The “Global Banana Enterprise and Techno-Fair” was likewise conducted on October 13, 2005, in coordination with the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD). The main goal of this activity was to provide a venue for the
exchange of information and experiences between national and international banana experts and the local banana processing and marketing sectors. Mr. Silan was internationally recognized as a model banana farmer during this event.

Later, he was awarded with the “Outstanding Coconut Farmer” award (Region IV) for having the best farm planted with coconut, intercropped with banana. As an incentive, PCARRD gave Mr. Silan and his family an all-expenses paid trip to Davao, to visit selected banana plantations in the area.

On December 11, 2006, he was again recognized with the “Outstanding Farmer for High-Value Commercial Crops” award by the Department of Agriculture (DA).

Mr. Silan currently serves as PCARRD’s Magsasakang Siyentista (Farmer-Scientist) for banana, an appointment awarded on August 15, 2005. As such, Mr. Silan was instrumental in providing and validating information for the council’s “Investment Package for the Commercial Production of Fresh Bananas: Lakatan and Saba.”

The municipality of Indang, Cavite honored him with the “Outstanding Farmer” award (Regional Gawad Saka) on December 1, 2007. Recently, he was given recognition for serving as a farmer-cooperator in the “S&T Anchor Program for Banana Project 1.4 - Insect Vectors,” a project of the University of the Philippines Los Banos’ (UPLB) College of Agriculture (CA).

Mr. Silan has likewise been able to establish political linkages in Cavite. Former Governor Juanito Remulla Jr. supports the Cavite Modern Growers, while Mayor Jun de Sagun of Trece Martirez City also provides assistance on a regular basis. Meanwhile, Governor Ayong Maliksi has recently granted Mr. Silan with two hand tractors to facilitate the land preparation in his farm.

At present, Mr. Silan regularly serves as resource person, technical expert and national evaluator for banana, dragon fruit and other high value commodities for various groups, such as schools, government and nongovernment agencies, and other similar groups, while his farm continues to serve as a model farm.

He has likewise expanded his farming venture and continues to devise his own farming innovations. He started venturing into swine, poultry and beef production for almost a year now. He has also started practicing new farm innovations, including the following: (i) the “half-moon technique” in fertilizer application for banana (to prevent wasting about fifty percent of the applied fertilizer); (ii) keeping height of the “mother tree” at around one
meter instead of cutting it close to the ground, so that the young trees could benefit from its remaining water content; (iii) leaving the dry leaves on the trees and within the area during the summer season to prevent the trees from drying up; (iv) keeping ear wigs in the farm to assist in controlling pests, particularly mealy bugs (integrated pest management); (v) using pig manure as organic fertilizer for dragon fruit; (vi) producing honey bees for added income and to assist in the pollination of dragon fruit plants; and (vii) using dragon fruit stem cuttings as livestock feeds (swine and beef). The farming bug has likewise caught on Mrs. Shirley Silan, Eddie’s wife; she has recently started venturing into vermiculture for added income and to facilitate in the production of organic fertilizer for the farm.

**IMPACTS**

**Policy Influence**

*Expanding policy capacities*

Mr. Silan’s development as a farmer-scientist has policy implications. For one, the knowledge that he shared to his fellow farmers has helped them increase their productions and incomes. He was likewise successful in influencing them to adopt scientific techniques, such as the use of tissue-cultured banana seedlings, paving the way for other farmers to be more scientific and evidence-based in their approach to farming.

The farmers’ organization that he helped form is likewise a good venue for supporting and developing innovative ideas from other farmers. The group could also be instrumental in developing the capabilities and communication skills of its members, as well as a base for identifying future farmer-scientists like Mr. Silan.

*Broadening policy horizons and affecting policy regimes*

Mr. Silan’s networking activities provide opportunities for teaching and/or learning from colleagues elsewhere. He could likewise be instrumental in introducing new concepts that could frame discussions or put ideas in public agendas. He is also in a position to educate researchers, development workers and the like to take on a broader understanding of issues, particularly those that concern local farms and farmers. His political linkages could similarly stimulate dialogue among decision-makers, gatekeepers and other influential stakeholders.
Moreover, his influence and stature already make him capable of persuading officials concerned in instituting modifications in existing programs or policies.

**Development Impact**

Mr. Silan has already proven that he is capable of contributing significant and lasting changes in the welfare of considerable number of beneficiaries. Specifically, he is in a position where he could easily introduce new technologies, knowledge and/or processes, or influence in adapting existing technologies, knowledge and/or processes used by a community to address a problem.

To illustrate, he was instrumental in disseminating the use of tissue-cultured banana seedlings and disease-resistant varieties to farmers within and outside of his community. He was likewise considered influential in the decision of members of the Cavite Modern Growers to adopt the use of tissue cultured banana seedlings. In effect, these actions are expected to contribute in alleviating poverty or enhance the quality of life within the community, specifically through an increase in farm productivity and income. Moreover, Mr. Silan is also a well-respected expert in dragon fruit production and he continues to share his know-how to his fellow farmers, as well as to the public, through his speaking engagements in various seminars, symposia and radio programs.

In addition, Mr. Silan continues to be the best example in highlighting the fact that there is big money to be earned in farming ventures, if one chooses to persevere hard enough in the business. Starting with only two commodities, he now produces around five different high-value crops and has even expanded his venture into livestock production (poultry, swine and beef). He was able to utilize the profits that he made in his initial ventures to establish and branch out into other farm projects, thereby continuing to increase both farm production and income.

**Research Capacity Building**

*Strengthening research institutions/centers and/or creating new institutions/centers*

Mr. Silan’s influence on other farmers to adopt the use of tissue cultured banana seedlings was instrumental in generating the clamor for requests for more of these seedlings. The existence of this demand helped in developing laboratories and improving physical infrastructure, as this prompted the University to convert its previous embryo culture laboratory for
orchids into a tissue culture laboratory for banana. Specifically, the said laboratory was established to answer the demand of the farmers for meriplants. These meriplants, in turn, will help facilitate the farmers in establishing their own nurseries, thereby reducing the cost of planting materials.

Moreover, he is also able to endorse the University to funding agencies for projects and/or grants, thereby strengthening its capacities.

Strengthening the research capacity of researchers

Mr. Silan has opened his demo farm to students and researchers alike, allowing them to conduct field trials, which practically makes it as an experiment station of sorts. In fact, he is currently assisting high school students from the CvSU Laboratory School in their research projects. These activities helped improve the capacity of researchers and students alike to initiate projects, as well as enhance their research capacities.

Scope of Research Activities

Mr. Silan’s participation in technology clinics and international fairs assisted in disseminating information regarding the technology about tissue cultured banana seedlings to reach different stakeholders, as well as government officials. His succeeding activities as a farmer-scientist and model farmer also continue to contribute to this end.

Innovation and Commercialization of Research

Mr. Silan was also able to contribute to the development of technologies and production processes to provide solutions to development challenges. For example, to answer the problem of having a low market price for one of the FHIA varieties (banana), Mr. Silan was able to assist in urging farmers to attend trainings in banana catsup and banana chips production, to increase the market value of the said banana variety. Moreover, he likewise continues to assist the University in the processing of fresh dragon fruit into jams, jellies, and other similar products, to answer the problem of the fruit’s short shelf-life, by helping in the experimentation and evaluation activities.

Impacts on Individual Researchers

Information regarding the local and scientific knowledge of Mr. Silan about farming could influence researchers and extension workers alike to take a different approach in tackling both research and extension activities,
respectively. His willingness to share information has likewise facilitated the process documentation needed for writing research papers and the conduct of research projects. This also continues to pave the way for the conduct of collaborative research with individual researchers and/or agencies, as evidenced by his collaborations with both Cavite State University (CvSU), the University of the Philippines – Los Banos (UPLB), Department of Agriculture-Cavite (DA-Cavite) and the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD).

Moreover, the information gathered from Mr. Silan and his farm could also contribute to the publication of research papers and participation in national or international conferences or symposia. This could also lead to the generation of new and/or additional funding for research in the future.

CONCLUSIONS

We could conclude that identifying and developing farmer-scientists among local farmers is a good initial step in conducting farmer-led research and development. Moreover, the development of a successful farmer-scientist could have positive and far-reaching influences in terms of: policy influence; development impact; research capability building; scope of research and development activities; innovation and commercialization of research; and impacts on individual researchers.

Moreover, it was found that the potential of farmers for research and experimentation could easily be developed if provided with the appropriate support from academic, research and funding institutions.

The results validate the potential of farmer-led research and development as a tool in bringing about rural and national development.

RECOMMENDATIONS

In view of the results, the authors recommend for the identification and development of additional farmer-scientists for other commodities and in other areas, as well as the conduct of more farmer-led research and development activities.
REFERENCES


Crucido, S.S. et al. 2006. Rehabilitation of the banana industry in Cavite, Philippines, through the use of local and introduced tissue-cultured banana varieties. Cavite State University (CvSU), Indang, Cavite.


Sustainable Agricultural Technologies and Practices Development Program: Poverty Reduction Tool

Mario B. Marigmen and Emelita V. Macadaeg

ABSTRACT

The “Sustainable Agricultural Technologies and Practices Development Program (SATPDP)” which is anchored on the research agenda of the Occidental Mindoro National College was crafted with the ultimate aim of participating in the province’s poverty reduction programs by promoting social, technical, economic, environmental and political development through the generation and verification of agricultural technologies and practices beneficial to the people of the province, most of whom are farmers. The program consists of several projects that include both basic and applied researches such as: 1) Inoculated Organic Fertilizer Production Project; 2) Vermicomposting Project; 3) OMNC Improved Banana Production Project; 4) Farm of the Past and Future Project; 5) Coco-farm Development Project; and 6) Technology Generation and Verification Project. The program accomplishments were as follows: 1) researches and verification studies; 2) establishment of organic fertilizer plant; 3) showcased agro-forestry technologies; 4) increased adoption rate of organic fertilizer in different communities; and 5) financial assistance to students through student labor. The program contributed remarkably in the improvement of livelihoods of farming families and had helped in the waste management of some piggeries in the province. Achievement of “very satisfactory” institutional rating of OMNC in the latest Agency Performance Evaluation conducted by DBM could be attributed to the outcomes of the said research program. Likewise, the program enhanced the Related Learning Experiences of the students. It demonstrated the importance of systematic implementation and undertakings as embodied on

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Director for Research and Research Coordinator, respectively, Occidental Mindoro National College, San Jose, Occidental Mindoro
a particular well-planned development program. More so, the functionality of institutional policies and guidelines was found to be very vital in achieving institutional efficiency and effectiveness. Hence, the program was able to complement in carrying out the four-fold functions of the college which are all geared towards improvement of living condition of its clienteles: research, instruction, extension and production.

INTRODUCTION

The education sector eats up a big chunk of the total national budget which goes to teachers’ salaries, construction of school buildings, instructional materials, books, laboratory equipment and many more.

Occidental Mindoro National College, as one of the arms of CHED, has gone through series of structural reforms in order to address agricultural sustainability in terms of social, technical, economic, environmental and political development. In its desire to achieve the goal of poverty alleviation as well as to address the different issues and concerns confronting the province, the college is obliged to undertake research and extension activities. By so-doing, it will be able to strengthen and complement its instructional function; diffuse appropriate technologies to the farmers and at the same time provide technical support to its own income generating projects. Parallel to this is its compliance with the national and regional development thrusts and mandates being stipulated in RA 7722, otherwise known as Higher Education modernization Act of 1994 which was further supported by RA 8292.

Hence, a particular SUC has to implement research programs and activities that shall benefit its clienteles in its respective service area to be worthy of the support being given to it by the state.

OMNC’s RDE unit is committed in developing technology packages and development strategies which are anchored on the principles of sustainable development and is supportive of the institutional vision of “holistically developing the total man contributory to societal and individual benefits through production, instruction, extension and research functions”.

To further strengthen the capability of the RDE Unit, it was moved to the OMNC Murtha Campus which has the facilities and areas very suitable to the conduct of various researches. The unit is now housed at the Community Outreach Center inside the said campus.
RESEARCH THRUST AND AGENDA

The Occidental Mindoro National College, through its Board of Trustees crafted its research agenda based on the Memorandum of Agreement which was forged between the National Economic and Development Authority, Provincial Planning and Development Officers and State Universities and Colleges in Region IVb. The agreement clearly identified the responsibilities of all concerned in order to address the problems besetting the different provinces in the region. The research agenda focuses on the integration and development of technologies that can be utilized to boost developmental activities. This research agenda is embodied in the institution’s Research Manual of Operation.

Anchored on the provincial and regional development programs and motivated by the RDE’s vision of becoming the center for generating new knowledge and appropriate technologies that would increase the quality of life of the clientele within OMNC’s service area for the next decade, the institution set its research thrust. To wit:

1. Protection of the environment and sustainability promotion
2. Technology generation for rice and vegetables through technology verification, experimentation and commercialization
3. Upland area sustainability promotion and protection
4. Aquaculture development both for inland and marine resources
5. Tourism
6. Cultural studies
7. Gender studies

THE RESEARCH PROGRAM

Cognizant of the RDE’s stated vision and mission, OMNC developed and implemented one of its research programs called “Sustainable Agricultural Technologies and Practices Development Program (SATPDP)”. The program encompasses development and generation of appropriate technologies which are acceptable, ecologically sound and most of all, affordable to all stakeholders. It is primarily implemented and managed by the whole RDE organization. The program consist several projects that include both basic and applied researches such as: 1) Inoculated Organic Fertilizer Production Project; 2) Vermicomposting Project; 3) OMNC Improved Banana Production Project; 4) Farm of the Past and Future Project; 5) Technology Generation and Verification Project; and 6) Coco-farm development project.
OBJECTIVES OF THE PROGRAM

The general objective of the program is to contribute to the province’s socio-economic upliftment through generation and verification of agricultural technologies and practices beneficial to the farmers of Occidental Mindoro. Specifically, it aims to:

1. Generate technologies that are acceptable and applicable under farmers’ fields in Occidental Mindoro;

2. Develop agricultural technologies based on the resources available in the area and therefore, ecologically sound and affordable to ordinary farmers and other stakeholders;

3. Verify and test technologies that had been developed outside OMNC’s research activities for local adoption;

4. Develop technologies and new knowledge that would complement instructional, extension and production functions of the college; and

5. Enhance agricultural management practices in order to increase farmers’ productivity

STRATEGIES APPLIED IN THE IMPLEMENTATION OF THE PROGRAM

Preparation Phase

Human Resource /Capability assessment. Personnel to be included in the project teams were identified by means of determining their expertise and field of interest. Capability and skills were enhanced through conduct of focus discussions, brainstorming, seminars and trainings.

Materials and Machineries Assessment. Resources, in terms of facilities, equipment and other materials needed in the conduct of experimentations and related studies.

Delineation of Target and Specific Concerns and Studies. After identifying personnel’s interest and capabilities, they were assigned on specific projects and studies related to the component projects. Availability of support personnel was also made in order to ensure continuity of activities in different projects.
Working Out and Assessment of Plans. Each project proponent was given the privilege to work out his/her plans together with the identified staff. Plan of activities were laid out and re-evaluated before projects were started, following the RD&E protocol as shown below.

1. Call for research proposals
2. Evaluation
3. Endorsement for funding
4. Funding of research projects/programs
5. Implementation of research projects/programs
7. Accomplishment reporting
8. Data collection, analysis, interpretation and report writing
9. In-house review
10. Presentation of research outputs to research forums
   - Local
   - Regional
   - National
11. Publication of research outputs

Implementation Phase

The implementation phase of the program followed the steps indicated:

Station studies/laboratory studies. Station and laboratory mentioned in here means either the field for crop studies or animal studies as well as the science laboratory. Many projects were conducted outside OMNC’s campuses. Instead, they were implemented in farmers’ fields or in the partner communities.

Multi-location trials. Various studies and projects were conducted in many other places within the province in order to test their local adaptability. It was found out that multi-location trials are also important in identifying local people who could assist in the implementation of projects.

Research monitoring. Research projects were regularly monitored for proper decision-making. Necessary actions were made based on the results of the monitoring activities conducted.

Reporting. Individual reports and write-ups of the projects completed were required among the individual proponents for proper unit load crediting.
In-house review and publication. In-house reviews are conducted annually. External evaluators are invited to critique projects intended for publication and presentations outside the institution.

Dissemination of results. Results of the studies conducted and outcomes of the different projects were disseminated in cooperation with the Extension Unit and other Academic Departments within the college. Project proponents were also encouraged to present their research outputs in different scientific forums, locally or internationally. There were also outputs published in the local Research Journal as well as in national and international communications media.

Table 1. Research outputs dissemination and promotion.

<table>
<thead>
<tr>
<th>Research Outputs</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional/National Presentation</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Publication/Journals</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>7</td>
<td>31</td>
</tr>
</tbody>
</table>

Dissemination

| Extension Activities (Hrs)       | 56   | 224  | 288  | 578  |
| Participants/hr                 | 840  | 1759 | 2599 |

Table 1 shows the number research outputs disseminated through different forms and media. This reveals the effort exerted by the institution to reach out its clientele. There was a one hundred percent increase in the number of research outputs presented in different forums from 2006 to 2007. However, there was a little reduction in the number of published outputs on the same period. There was a remarkable increase in the number of activities as well as participants on the same given period although there were missing data on the preceding years.

THE DIFFERENT COMPONENT PROJECTS

Inoculated Organic Fertilizer Production Project

The purpose of the project is to produce organic fertilizers out of farm organic wastes through rapid composting using an inoculant.

Table 2 shows the project and its component studies and sub-projects.

The project which started as an institutionally funded one had been extended to nearby farms and had helped one of the big piggery farms in Occidental Mindoro to effectively manage the waste it had generated.
Table 2. Research projects under the inoculated organic fertilizer production project.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author/Proponent</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inoculated Organic Fertilizer Production Project</td>
<td>Benedicto R. Batiles, Jr.</td>
<td>2005-2010</td>
</tr>
<tr>
<td>Related studies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Efficacy Trial of Inoculated Rice Hull and Hog Manure Mixture on the Growth and Yield of Eggplant</td>
<td>Benedicto R. Batiles, Jr.</td>
<td>2003</td>
</tr>
<tr>
<td>b. Utilization of Composted Rice Hull and Hog Manure Mixture: A Sustainable Waste Management Farming Practice in Occidental Mindoro</td>
<td>Benedicto R. Batiles, Jr.</td>
<td>2005</td>
</tr>
<tr>
<td>c. Guano-based Organic Fertilizer Production by the IPs of Sitio Emoc, Pacololo, Magsaysay, Occ. Mindoro</td>
<td>Benedicto R. Batiles, Jr. and Ronaldo G. Orpiano</td>
<td>2006</td>
</tr>
<tr>
<td>d. Percentage Decomposition of Inoculated Rice Hull and Hog Manure Mixture</td>
<td>Benedicto R. Batiles, Jr.</td>
<td>2003</td>
</tr>
<tr>
<td>e. Growth and Yield Response of Selected High Value Commercial Crops on Seaweeds Bionutrient-enriched Organic Fertilizer</td>
<td>Benedicto R. Batiles, Jr.</td>
<td>2007</td>
</tr>
</tbody>
</table>

The college is now earning considerable amount of income from the project through the sales of the organic fertilizer and liquid inoculant it had produced. The technology had been extended to the Department of Agriculture Provincial Office by training their staff in the preparation of the inoculant which they are now using in producing their own organic fertilizer. The organic fertilizer that OMNC produced had undergone efficacy trial by an external researcher and is waiting for its patent and registration with the Fertilizers and Pesticides Authority.

A financial support from NEDA through its KR2 Project enabled the project to expand and increase its production level.

As a support, the RDE Unit assists in the advocacy campaign of organic farming through conduct of seminars and lectures.
Vermicomposting Project

Table 3. Research projects under the vermicomposting project.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author/Proponent</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermicomposting Project</td>
<td>Arnel A. Magarro</td>
<td>2003-2008</td>
</tr>
<tr>
<td>a. Growth and Yield Performance of Watermelon as Affected by Vermicompost Supplementation</td>
<td>Arnel A. Magarro and Emmanuel Pascua</td>
<td>2004</td>
</tr>
<tr>
<td>b. Growth Performance of Mallard Ducks Supplemented with Fresh Vermiworms</td>
<td>Arnel A. Magarro and Emmanuel Pascua</td>
<td>2004</td>
</tr>
<tr>
<td>c. Effects of Varying Rates of Vermicompost on the Yield of Eggplant, Tomato and Bell Pepper</td>
<td>Mario B. Marigmen and Arnel A. Magarro</td>
<td>2007</td>
</tr>
<tr>
<td>d. Effects of Varying Rates of Vermicompost on the Growth and Yield of Yam in Sacks of Growing Medium</td>
<td>Arnel A. Magarro and Artemio A. Bañaga</td>
<td>2005</td>
</tr>
</tbody>
</table>

The project is another organic fertilizer production project which is financed and supported by the institution. It had an initial support from the Philippine Council for Marine and Aquatic Resources Research and Development. It utilizes manures from the livestock projects of the school in combination with different crop residues and decomposable plant parts. The organic substrates are converted to organic fertilizer called vermicompost by the action of earthworms. The objective of the project is to provide vermicompost to backyard scale gardens of horticultural crops.

OMNC Improved Banana Production Project

This project is very new. It is an offshoot of the studies: Status, Problems and Potentials of Banana Industry in Occidental Mindoro (Orpiano, et. al., 2007); and Profile of Banana Growers in Occidental Mindoro (Orpiano, et.al., 2007). The project addresses the program of Southern Tagalog Agriculture and Resources Research and Development Consortium (STARRDEC) prioritizing banana production in the province. Through the initiative of the Director of the RDE, banana plantlets were requested from the Department of Agriculture Region IVB (MIMAROPA). The plantlets had been delivered for free and are now reared in the nursery of OMNC Murtha Campus. Permit for Domestic Transport of Plants/Plant Products (Annex ) shows the point of origin and condition of the plantlets.
Table 4. Research projects under the OMNC improved banana production project.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author/Proponent</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMNC Improved Banana Production Project</td>
<td>Mario B. Marigmen</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Related studies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banana Industry in Occidental Mindoro</td>
<td>G. Lumbo and Mary Yole Apple M. Declaro</td>
<td></td>
</tr>
<tr>
<td>b. Profile of Banana Growers in</td>
<td>Ronaldo G., Orpiano, Susanita</td>
<td>2007</td>
</tr>
<tr>
<td>Occidental Mindoro</td>
<td>G. Lumbo and Mary Yole Apple M. Declaro</td>
<td></td>
</tr>
</tbody>
</table>

Farm of the Past and Future Project

It has been started very recently with the initial funding taken from the operational budget of the RDE Unit. It is one of the unit’s humble ways of responding to the call for biodiversity conservation.

Table 5. Research projects under the “Farm of the Past and Future” project.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author/Proponent</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm of the Past and Future Project</td>
<td>Mario B. Marigmen</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Sub-projects:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Culture and Propagation of Native Freshwater Fishes and Snails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Organic Production of Indigenous Vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Establishment of Medicinal Plants Garden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Production of Native Chicken</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Farm of the Past and Future” project is located in a half-hectare area inside the school campus. It is envisioned to become the gene pool of endemic species of plants and animals in the province that are used as food. Most of them are now on the verge of extinction due to indiscriminate usage and collection. An attempt to retrieve and perpetuate these species should be made this early to avoid their catastrophic elimination from the surface of the earth. Thus, this project was thought of and now being implemented.
The following projects had been started inside the farm:

1. Culture and Propagation of Native Freshwater Fishes and Snails

2. Organic Production of Indigenous Vegetables

3. Establishment of Medicinal Plants Garden

4. Production of Native Chicken

When completed, the farm will be able to supply farmers and other clienteles stocks which they can also culture in their respective farms. This project may also provide necessary genetic material for future plant and animal improvement.

Technology Generation and Verification Project

Table 6. Studies conducted for technology generation and verification project.

<table>
<thead>
<tr>
<th>Title of the Study</th>
<th>Researcher</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| Agroforestry Project for Indigenous Community Development in Occidental Mindoro | Garry L. Calitang and Nelson A. Orfiano | Increased productivity of the IPs and prevented dropping out of classes of school children because of the food supplied by the project.  
Showcased Appropriate Upland Technology and Learning Laboratory of Agriculture Students  
Soil fertility map of the study sites was produced |
| Upland Farming System Development Project in OMNC Experimental Agroforestry Center | Garry L. Calitang Nelson A. Orfiano and Ronaldo G. Orpiano | Showcased Appropriate Upland Technology and Learning Laboratory of Agriculture Students  
Soil fertility map of the study sites was produced |
| Salinity, Nutrients and Productivity of Soils in Selected Sites of Magsaysay, Occidental Mindoro | Ronaldo G. Orpiano and Emmanuel G. Ruedas | Differences of the effects were not significant. However, the slight increase in the growth and yield promises more positive effects especially in the disposal of rice hull.  
Still in progress. One more cropping season is required before termination of the study |
| Effects of Different Forms and Rates of Rice Hull on the Growth and Yield of Rice | Ronaldo G. Orpiano, Garry L. Calitang and Nelson A. Orfiano | Differences of the effects were not significant. However, the slight increase in the growth and yield promises more positive effects especially in the disposal of rice hull.  
Still in progress. One more cropping season is required before termination of the study |
| Growth and Yield Response of Different Rice Varieties in Rice Hull Ameliorated Soil | Arnold N. Venturina and Artemio T. Bañaga | Differences of the effects were not significant. However, the slight increase in the growth and yield promises more positive effects especially in the disposal of rice hull.  
Still in progress. One more cropping season is required before termination of the study |
The RDE Unit, with the full support from the school administration is aggressively pushing for the implementation of more projects in order to generate more sustainable technologies and practices that will redound to the benefit of the province’s populace—the farmers.

Coco-farm development project

This project was implemented through a MOA and funding between Agricultural Colleges Association of the Philippines, Federation of Free Farmers-Oil Millers Group and OMNC. This project intends to provide quality coconut seedlings to farmers who are willing to participate in the coconut industry development in the province. To date, about 30,000 seedlings are already available in the nursery, ready for planting. This number exceeded the target for the given period stipulated in the agreement.

INSTITUTIONAL BENEFITS FROM THE PROGRAM

Programs, when supported by the administration would improve work performances and ultimately the organization’s performance.

In this paper, the evaluation reveals significant contribution of the SATPDP in increasing the research and extension outputs of the college—one of the DBM performance indicators.

The Institution’s positive outlook of the RD&E goals and objectives led to a series of changes which yielded improved productivity. Supports from the administration were evident in the job performance of the researchers and extensionists as indicated by their respective outputs.

Table 7. Annual performance review report.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical accomplishment</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Financial accomplishment</td>
<td>Outstanding</td>
<td>Outstanding</td>
<td>Outstanding</td>
<td>Outstanding</td>
<td>Outstanding</td>
</tr>
<tr>
<td>Income</td>
<td>Fair</td>
<td>Very satisfactory</td>
<td>satisfactory</td>
<td>Satisfactory</td>
<td>Very satisfactory</td>
</tr>
<tr>
<td>Overall adjectival Rating</td>
<td>Fair</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

Source: DBM Annual Performance Review Report
The researches conducted are proofs that OMNC, indeed was able to efficiently and effectively use the support and resources being provided by the state as shown by the remarkable change in its Annual Performance Rating (APR) in the evaluation conducted by the DBM Region IVB. Table 7 shows the performance rating of OMNC from the period 2004 to second semester 2007.

The satisfactory rating of the Physical indicator for the period July to December, 2007, where research is one of the components pushed the overall rating to “very satisfactory”. This clearly shows that the college is putting premium on research as suggested in previous APRs which empowers the technical/teaching personnel which made them to be at par with other SUCs in Region IVb (DBM, R-IVB, 2007).

With the banner research program discussed herein, the authors are very optimistic that achieving the institutional vision, mission, goals and objectives is not far from reality.

CONCLUSION

The results and outcomes of various projects and studies under the program were able to generate technologies and practices that assisted the stakeholders, specifically the farmers in improving their farming practices and livelihood projects.

The organic fertilizer production project was able to address the problem of farmers on expensive farm inputs especially fertilizers. The inoculant being used for rapid composting was found to be very useful in the waste management program of some piggeries in the province. The program therefore is not only a mean in reducing poverty but will also address the problem on environmental destruction and pollution.

The increased research activities also brought about an increase in the overall performance rating of the institution.

Well-planned program of activities provide the needed guidance and management options among the implementers in increasing efficiency and effectiveness.

The presence of functional policies and guidelines brought about internal efficiency as well as external productivity caused by highly motivated researchers and extensionists.
RECOMMENDATION

Projects and programs are being implemented to produce outputs beneficial to both humans and their environment. It is highly recommended that studies focusing on social dimensions be conducted in order to identify behavioral factors that enhance or constraint adoption and diffusion of programs and their benefits.

The monitoring and evaluation mechanism should be sustained in order to provide timely information about the projects in order to make the necessary managerial adjustments when needed.

Impact assessment must be conducted in the future to determine the long-term effects of the program specifically in the reduction of poverty in Occidental Mindoro.

REFERENCES


Yam (*Dioscorea alata* Linn.)
Research – Industry Partnership Program

Ernesto R. Gapasin, Florentina S. Dumlao, Evangeline M. Pera, Jaime C. Dulatre, Cecilia C. Villamor, Anabella G. Valdez, Ernesto M. de Padua, Jessie D. Almoite, and Merlito D. Tangalin

**ABSTRACT**

Research and development (R&D) management plays a vital role in bridging the gap between research institutions and the industry. In compliance with the functions of the university, the program aimed to increase farmers’ productivity and establish income-generating projects through a network of strategic R&D management mechanisms. Mature technologies were extended through various approaches in order to develop an enterprise in ube sett, tuber, flour and by-product production.

As a knowledge-based research and development management process, the program utilized the R&D Framework from technology generation, technology adoption, technology verification, technology dissemination, technology utilization and technology commercialization.

In its training component, eight (8) ube school programs were conducted covering the whole gamut of ube production with 321 participants. Results of the integrated extension program were presented in eight (8) scientific conferences, two (2) of which were international (Indonesia and China), and six (6) in national techno fora/symposia.

The program technically assisted 185 farmers and responded to 78 different farmer calls through the subject

---

1. Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2. University President, Vice President for Research and Extension, Program Leader, Project Leader, Researcher, and Research Assistant, respectively, Don Mariano Marcos Memorial State University, Bacnotan, La Union
matter specialists and using the “Professor in the Barangay Concept”.

Twelve thousand copies of printed materials were circulated (techno calendar, leaflet and technoguide). Further, these were disseminated through national dailies (3), international journals (2) and six (6) national scientific journals. Likewise, radio, television, exhibit/trade fair and posters were used as avenue for technology dissemination.

In order to enhance awareness, series of community projects in the form of techno demo were conducted. Five (5) farmers’ information technology service centers were launched which consequently led to the formation of six (6) farmer-associations.

The aforesaid extension strategies resulted in the utilization and commercialization of yam technologies. The farmers produced 126,000 ube sett amounting to P1, 512,000.00 and harvested 82,000 kilograms of tubers amounting to P1, 417,000.00. The flour produced amounted to P1, 048,250.00. The total income was P3, 977, 250. 00. With this, a return on investment (ROI) of 50-60% was realized.

The ube flour was processed into ube roll, cake, tart, jam, candy bar, custard, cupcake, puto, tupig and bibingka.

Part of sustaining the farmers’ adoption process, business assistance services were extended, including fund support from various GOs and NGOs in the amount of P1, 302,000, a Bar Code, packaging and labeling and a component technology.

The program is in response to the Millennium Development Goals (MDG), Agriculture and Fisheries Modernization Act (AFMA), Intellectual Property Rights (IPR), Information Communication Technology (ICT) and Food Security Program, that are generally answering the regional thrust. It is likewise supported by the DA-RAFC, NEDA-RDC, DOST, DTI, TESDA and the Local Government Units and other institutions.

All these accomplishments cannot be attained without the RDE policies covering the integration of multi-disciplinary approach, diffusion process, interrelationship between and
among stakeholders, participatory and complementation of ube in the R&D framework that ultimately paved the way to the attainment of economic and social benefits which is a strong basis for an existing research and industry partnership.

The university provided institutional support in terms of its organizational, infrastructural and policy framework.

**RATIONALE**

As a research manager, SUCs should zero-in on the role of establishing a partnership relationship with the industry. The demand of the time is to collaborate and tap all stakeholders in the advancement of the agricultural sector as one of the sources of the Philippine Gross Domestic Product (GDP).

Yam or ube belongs to family Dioscoreacea. Ube (Dioscoreacea alata Linn.) is also known as greater yam, water yam and ube among Filipinos. This has been a minor crop but with its commercial potential being recognized in the country today, it is now one of the top high-value commercial crops.

Commodity wise, the demand for yam product is high, locally and in foreign markets. Yam (Dioscorea alata L.) is a promising high-value root crop of the Philippines. Considered as a viable crop because of its medicinal value, it is an active ingredient in birth control pills. Cortison, adrenosterone, progesterone and diosgenin could be extracted from yam. The violet color of yam is due to anthocyanin pigment, which is claimed to have anti-cancer properties. Its nutrient contents include calcium (19mg) and phosphorous (44mg) /100 grams edible portion. In the Philippines, root crops occupy 1.1 million hectares of agricultural lands, contributing 4% gross value added for the agriculture sector.

**Objectives**

Generally, the paper aims to present the management system for the Yam (Dioscorea alata Linn.) research and industry partnership to sustain livelihood and income.

Specifically, the paper aims to showcase the following:

1. Utilize a research and development management system approach;
2. Integrate the research and industry partnership in the R&D continuum;
3. Showcase a research and development/extension support mechanisms for the yam program; and

4. Determine the yam industry contribution to farmer’s productivity.

**METHODOLOGY**

This management paper made use of a developmental study in order to showcase a network of partnership between research and development institution to the industry. This employed a conceptual framework of designing research and development/extension strategy (Figure 1) such as:

1. Research and Industry partnership in the R&D Continuum for the Yam Program;

2. Research & Development/Extension Support mechanisms to the Yam program; and


The importance of the ube was recognized by government institutions like the National Economic and Development Authority (NEDA) as a strategic commodity in compliance to the Food Security program; as a commodity champion in relation to the Anti-Poverty program.

In like manner, Philippine Council for Agriculture and Natural Resources Research and Development – Ilocos Region Agriculture and Natural Resources Research Consortium (PCARRD-ILARRDEC) recognized it as a regional commodity.

**Research and Development Management System Design**

The university’s management intervention for the Yam R&D Program was designed using a system approach. With this management system, it will ensure the continuity and sustainability of the program serving its purpose of attaining result. The system involved the following:
1. Systems Analysis and Evaluation – What is the existing system? What is wrong? How can it be fixed? In designing the program, we reviewed related data/information in order to address the existing system such as government targets and policies, research performance, research results, the theory of development and the future of the yam industry.

2. Systems Design and Development – What should be done? How should it be done? This process covered a system of planning and goal setting wherein the multi-disciplinary approach was a priority strategy in converting the RDE of the yam industry. They expand its partnership; the program employed a networking system in the R&D Continuum. A well-organized system of partnership was developed and implemented.

3. Implementation – What, when, who, where, why and how much is the program? The implementation is part of the discussion of results. This covered: 3.1 Research and industry partnership in the R&D Continuum; 3.2 Research and extension support mechanisms to the yam industry; and 3.3 Yam industry contributions to farmer’s productivity.

Figure 1. Conceptual framework.
4. Evaluation – What are the indicators/outputs? What are the technologies utilized and commercialized? What are its radiation effects? An institutional and multi-agency process of monitoring and evaluation was conducted to measure the extent of the implementation of the program. The process involved the following:

4.1. Proposal Review Instruments. The University designed its own proposal review instrument.

4.2 Quarterly Monitoring of RDE. Once a project is implemented, a quarterly monitoring is done to ensure that the plan is followed, and trace problems affecting the implementation of the plan and make the necessary alternative action and decision making.

4.3 Agency In-House Review (AIHR) and Commodity Review (CR). An annual agency in-house review is conducted by the University and the DOST-PCARRD-ILARRDEC conducts a regional commodity review on the cultural practices. DOST-PCIERD-ICIRED conducts a review on the Post Harvest Technology.

4.4 Technology packaging. As a result of the reviews conducted, technologies classified under technology for dissemination are packaged into the “La Union Technoguides” and are also disseminated thru the use of pamphlets, leaflets, technocalendars, ube schools and other technology dissemination strategies.

DISCUSSION OF RESULTS

Research and Industry Partnership in the R&D Continuum

The research and industry partnership was designed to follow the R&D Continuum (DARCOP Model 1991). The continuum covers: technology generation (TG); technology verification (TV); technology adoption (TA), technology dissemination (TD), technology utilization (TU); and technology commercialization (TC).

The new Model gives emphasis on the process of technology utilization and commercialization for the very purpose of promoting entrepreneurship in the rural areas and supporting our country’s goal of attaining livelihood development and employment generation such as:

1. Participatory approach within the Research, Extension and Client Systems.
To ensure a higher level of technology adoption, the client system must
be included in the technology development process of the R&D continuum. This will help facilitate the diffusion process since the clients are the ultimate adopters of technology. Thus, they must be involved in the planning and implementation of R&D projects (Figure 2). The client is represented by the industry sector.

![Diagram showing participation of the research, extension and client systems within the R&D Continuum.](image)

**Figure 2.** Participation of the research, extension and client systems within the R&D Continuum.

2. Multi-Disciplinary Approach. Multi-disciplinary approach in an RDE Knowledge-Based Technology is considered in the development of the program and in response to the complexity of the technologies required for the industry. DMMMSU conducted a variety of studies from 2000 to present in order to cover the whole production and social technologies.

The networking intervention of yam RDE through a multi-disciplinary approach is presented in Table 1. It covered the year implemented and the various disciplines involved in the conduct of the research and extension activities. Figure 3 reflects the integration of the multi-disciplinary approach to the R&D Continuum in terms of research and development and the industry.
Table 1. Yam R&D program and industry linkage in a multi-disciplinary approach.

<table>
<thead>
<tr>
<th>STUDY</th>
<th>YEAR IMPLEMENTED</th>
<th>DISCIPLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Characterization of Yam Cultivars</td>
<td>2000-present</td>
<td>Breeder, Botanist</td>
</tr>
<tr>
<td>II. Cultural Management of Yam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Establishment of Yam Plantation for Technology Verification and</td>
<td>2002-present</td>
<td>Horticulturist</td>
</tr>
<tr>
<td>Demonstration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Identification/Preventive Studies of Yam</td>
<td>2001-2002</td>
<td>Entomologist</td>
</tr>
<tr>
<td>3. Pests and Diseases in Region I</td>
<td>2001-2002</td>
<td>Agronomist, Horticulturist</td>
</tr>
<tr>
<td>4. Vine Cutting Propagation and Tuber Storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Effect of Different Organic and Inorganic Fertilizers on the</td>
<td>2003-2005</td>
<td>Soil Scientist, Agronomist,</td>
</tr>
<tr>
<td>Yield of Yam Planted in an Alley Cropping System</td>
<td></td>
<td>Horticulturist</td>
</tr>
<tr>
<td>an Alley Cropping System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Mass Propagation of Planting Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through Vine Cuttings</td>
<td>2001-2002</td>
<td>Agronomist, Horticulturist</td>
</tr>
<tr>
<td>IV. Post-Harvest Practices and Processing of Yam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Improvement of Processing and Shelf-life of Yam Flour and Chips</td>
<td>2002-2005</td>
<td>Engineer, Food Technology,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nutritionist, Chemist</td>
</tr>
<tr>
<td>2. Yam Steaming and Grating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Yam Drying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Phytochemical, Microbial and Sensory Analysis of Yam Flour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Development and Formulation of Different Yam Processed products,</td>
<td>2002-present</td>
<td></td>
</tr>
<tr>
<td>Packaging and Shelf-life Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V. Development of Techno-Model Farm for Yam</td>
<td>2001-present</td>
<td>Extensionist, Soil Scientist</td>
</tr>
<tr>
<td>VI. Yam Technology Packaging and Dissemination</td>
<td>2002-present</td>
<td>Dev’t. Com., Extensionist</td>
</tr>
</tbody>
</table>
3. Participatory Approach. Institutions, whether government or non-government, are a significant element in the life of R&D management. The partnership involved government organizations (GOs) and non-government organizations (NGOs). The GOs are: a) DMMMSU; b) Technical Education and Skills Development Authority (TESDA); c) Department of Agrarian Reform (DAR) through the Asian Development Bank and Agrarian Reform Communities (DAR-ADB-ARCs); d) Department of Agriculture (DA); e) Department of Science and Technology - Technology Application and Promotion Institute – Science and Technology Enterprise Assistance Mechanism – Municipal Science and Technology Assistance Program (DOST-TAPI-STEAM-MSTAP) and the Philippine Council for Agriculture and Natural Resources Research Development – Ilocos Region Agriculture for Natural Resources Research Consortium (PCARRD-ILARRDEC); f) Department of Trade and Industry (DTI); g) National Economic and Development Authority (NEDA); h) Office of the Provincial Governor (OPG) and the Local Government Units (LGUs). The NGOs are: a) ADB; b) ARCs; c) La Union Yam Growers Association (LUYGA); and d) Provincial and Municipal Agriculture Fisheries Council.
(PAFC and MAFC). The industry sector is composed of the Chemfree Food Delights and five (5) small scale entrepreneurs. Figure 4 shows the participation of GOs and NGOs in the R&D Continuum.

Figure 4. Participation of the GOs and NGOs in the R&D Continuum supportive of research and industry partnership.

Research and Extension Support Mechanism to the Yam Program

The support mechanism had been extended since 2000. The report covered only from 2005 – 2007.

1. Training/Scientific Conference/Techno Fora/Symposia Programs

- Trainings – A total of eight (8) ube school programs were conducted with a total of 321 trained farmers. Skills development on yam production needs intensive training to guarantee the production of marketable setts and tubers. This is done through training-cum-workshops on the whole gamut of yam production up to ube food processing, marketing and packaging. This is usually done through the Ube School.
- Scientific Conference – The program was presented in six (6) venues, two (2) of which were in an international venue (Indonesia and China) and the others were in the Philippines.

- Techno Fora/Symposia – The extension papers were presented in regional and agency-in house review (AIHR) and in selected conferences like Foundation days and farmers’ field days. Successful farmers were encouraged to share their experiences in ube production. Table 2 shows summary of training, scientific conference, techno fora and symposia extended by the program.

Table 2. Training/Scientific Conference/Techno Fora/Symposia Program.

<table>
<thead>
<tr>
<th>Strategy/Description</th>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2006</td>
</tr>
<tr>
<td>1. Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Number of Trainings</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>- Number of Participants</td>
<td>149</td>
<td>40</td>
</tr>
<tr>
<td>2. Scientific Conference (no.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- International Paper Presentation</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>- National Paper Presentation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- Regional Paper Presentation</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>3. Techno Fora/Symposia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- International</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- National</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Local</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Technical Assistance and Advisory Services

Technical Assistance and Administrative Services were extended to the producers of setts, tubers and ube powder to ensure the success of each undertaking. The University, through its program of Professor In Every Barangay (PIB) and the availability of Subject Matter Specialists (SMS), facilitates the progress of the project coupled with the regular monitoring and evaluation through dialogues, consultations and meetings. A total of 185 technical assistance activities were conducted through consultations via SMS/letters. Other services conducted were through farmer’s calls with a total of 78 farmers served. Advisory services on field evaluation and laying-out, planting, soil and topography inspection, insect and pest and disease diagnoses were done by the group of SMS to said clients.
• **PIB Component**

✓ Ube in Every Home. In response to the Food Security Program, the University is promoting the Ube in Every Home Program thru various gatherings and meetings.

✓ Ube in Sacks. Land is not a problem in the production of ube tubers. The program is utilizing the “ube in sacks” which compliments the urban gardening or the backyard intensive gardening (BIG) program.

2 **Communication/Information Services**

The program made use of a wide array of materials to massively disseminate the program’s activities as well as to create people awareness on the benefits of ube production technology (Table 3).

**Table 3. Communication and information services.**

<table>
<thead>
<tr>
<th>Strategy/Description</th>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Techno Calendar (No.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Number of copies</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>2. Leaflet (No.)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>- Number of copies</td>
<td>2,000</td>
<td>4,000</td>
</tr>
<tr>
<td>3. Technoguide (No.)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>- Number of copies</td>
<td>2,000</td>
<td>5,000</td>
</tr>
<tr>
<td>4. Newspaper/Media Release</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>5. Journal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- International</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>- National</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>6. Radio Program</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7. Television</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>8. Exhibit/Trade Fairs</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>9. Poster</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

• **Publication** – To widen the yam coverage of beneficiaries and production area, the program distributed various brochures, pamphlets/leaflets, and/or technocalendar. Publication in research journals and national dailies/paper also widen the information dissemination.
• Techno Calendar – Mature technologies of various commodities as a result of research are disseminated in the form of calendars, which were distributed to farmers. Every year, the university publishes a calendar. In 2005 to 2007, the calendar featured ube technologies and products.

• Leaflet and technoguide – A simplified and outlined procedure on technology for ube production and processing was made and distributed to farmers as reference materials. There were five (5) technoguides published with a total of 5,000 copies.

• Newspaper – National newspapers and magazines published news about yam. Sac Zarian a noted journalist/writer featured “The La Union Experience” and “How to Grow Ube” in the Philippine Agriculture Magazine of the Manila Bulletin. An article “Farmers Find Profit in Ube Production” by Zosimo Ma. Pablico was published in the Manila Times.

• Journals – The yam program was published in two (2) international journals and in six (6) national research and extension journals.

• Radio Program – Ube production technologies were also aired at DZAG, Radio Station, Agoo, La Union.

• Television – The program was also featured by ABS-CBN Channel 2, “Kumikitang Kabuhayan” Series Program and other networks.

• Exhibits/Trade Fairs – In all university, municipal, provincial, regional anniversary Foundation days and research and extension days, the ube program was showcased. The program also participated in the “RIMAT TI AMIANAN”. Recently, it participated in a national exhibit at the SM Mega Trade Hall, Mandaluyong City on August 21-24, 2008 during the DA-BAR Agriculture and Forestry Technology Commercialization Fair.

• Poster – Appropriate technologies were also exhibited through posters.

4. Community Extension Activities

Various activities were done to reach out to more farmers through community activities, namely: techno demo, Farmers’ Information and Technology Services; (FITS), formation of Association and enterprise development (Table 4).
Table 4. Community extension activities.

<table>
<thead>
<tr>
<th>Strategy/Description</th>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Techno Demo (no.)</td>
<td>2005</td>
<td>2</td>
</tr>
<tr>
<td>2. FITS Center Launched</td>
<td>2006</td>
<td>3</td>
</tr>
<tr>
<td>3. Associations Formed</td>
<td>2007</td>
<td>7</td>
</tr>
<tr>
<td>4. Total</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

- Techno Demo – to establish a closer link between and among farmers and to train farmers to adapt the ube technologies, the farmers’ fields were set up. Technologies were demonstrated in 17 techno demos. Two (2) of our ube farmers are FITS contact persons, and serve as “Magsasakang Siyentista” in the production of Ube.

- Farmers’ Information and Technology Services (FITS) Centers – Sixteen (16) municipalities in La Union serve as the formal source of technologies on ube since 1999. Handouts are made available in the center and ube technologies are in the web site which can be accessed by the farmers.

- Formations of Association – There were 6 farmer associations formed. Every after training program conducted, sets of officers were formed to come up with farmer cooperatives, thus, facilitating marketing of products.

5. Business Assistance Services

The program is being assisted from program planning to implementation and evaluation and within the R&D/E Framework. The Department of Science and Technology (fund support) and the National Economic and Development Authority (fund support), Technical Education Services and Development Authority (training and equipment), Department of Agriculture, (promotion) to farmers and training, coordination with the Municipal Agriculture and Fishery Council (MAFC), Provincial Agriculture and Fishery Council (PAFC) and the Regional Agriculture and Fishery Council (RAFC), Department of Trade and Industry (DTI), etc. supported the program (Table 5).
Fund Generation

Table 5. Source of external funds.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount (P)</th>
<th>Source of Fund</th>
<th>Status of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>175,000</td>
<td>STEAM-MSTAP</td>
<td>On-going</td>
</tr>
<tr>
<td>2006</td>
<td>312,000</td>
<td>STEAM-MSTAP</td>
<td>On-going</td>
</tr>
<tr>
<td>2007</td>
<td>815,000</td>
<td>NEDA-PEP (KR2)</td>
<td>On-going</td>
</tr>
<tr>
<td>Total</td>
<td>1,302,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BAR Code – Products were assigned respective BAR Codes by the GS1 Company.

- Ube cake: 4806511270408
- Ube Bar: 4806511270378
- Ube Tart: 4806511270385
- Ube Macaroon: 4806511270392
- Ube Roll: 4806511270311
- Ube Powder: 4806511270496
- Ube Bibingka: 4806511270408

Packaging and Labeling – The ube bibingka had a packaging and labeling study assisted by the DOST.

Figure 5. Packaging material good for 12 and 16 pieces of ube bibingka/box.

6. Technology Utilization and Commercialization
Yam Industry Contribution to Farmer’s Productivity

- Technology Utilization and Commercialization

As a result of the program since 2000, there were 1,191 farmers trained up to 2007. Out of these farmers, 584 were producers of ube tubers wherein a total of 82,000 ube sett were produced (Table 6).

Five (5) farmers are commercial sett producers financially assisted by the DOST-STEAM-MSTAP Program. This endeavor enabled farmers to obtain an ROI of 50-60%. One (1) ube flour producer in commercial scale has produced P1,048,250.00 marketed to various enterprises in Tagaytay City, Manila and to various walk-in buyers.

Farmer’s productivity is measured in terms of income of the farmers both as individual and commercial scales with a total of P2,693,250.00. An overall income of P3,977,250.00 was generated from the project as a result of the research and industry partnership.

Table 6. Technology utilization and commercialization.

<table>
<thead>
<tr>
<th>Strategy/Description</th>
<th>Year</th>
<th>Total</th>
<th>Farmer’s Total Income (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>1. Farmer Producer (Individual)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Tuber Producers (no.)</td>
<td>241</td>
<td>191</td>
<td>152</td>
</tr>
<tr>
<td>Tuber Production (P)</td>
<td>192000</td>
<td>285000</td>
<td>940000</td>
</tr>
<tr>
<td>1.2. Ube Sett Production (no.)</td>
<td>16000</td>
<td>19000</td>
<td>47000</td>
</tr>
<tr>
<td>Ube Sett Production (P)</td>
<td>984000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td></td>
<td>2401000</td>
</tr>
<tr>
<td>2. Commercial Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Sett Producer (no.)</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Ube sett production (no.)</td>
<td>-</td>
<td>-</td>
<td>44000</td>
</tr>
<tr>
<td>Sett Produced (P)</td>
<td>-</td>
<td>-</td>
<td>528000</td>
</tr>
<tr>
<td>2.2. Ube Flour Producer (no.)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Flour Product (P)</td>
<td>231350</td>
<td>297000</td>
<td>520000</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td></td>
<td>1576250</td>
</tr>
<tr>
<td>Total Farmer’s Productivity (P)</td>
<td></td>
<td></td>
<td>3977250</td>
</tr>
</tbody>
</table>

Products that are developed and are ready for technology commercialization are: ube rolls, ube cake, ube tart, ube jam, ube candy, ube bar, ube custard, ube cupcake, ube puto, ube tupig and ube bibingka.
CONCLUSION

The paper proved the application of the theories of management as an example of transforming SCUs into a learning organization.

1. The management of an RDE program is totally dependent on the utilization of a variety of innovative practices. A modified systems design/approach can be adopted in order to attain significant results and in attaining the expected goal of sustaining livelihood development through enterprise development.

A modified systems approach could be adopted in the management of RDE programs which covers: systems analysis and evaluation, systems design and development; and implementation and evaluation. On systems analysis and evaluation, related data and information was analyzed in relation to government targets and policy, research performance, research results, future of the yam industry and the old theory of development.

Systems design and development should consider the planning process, goal setting, multi-disciplinary approach, networking systems within the R&D continuum and participatory approach within the research, extension and client systems. The client system is the industry partner. The process will ensure the complementation and integration of various disciplines, partnership development and empowering the stakeholders that lead to farmer’s productivity.

During the implementation stage, the RDE management strengthened the use of the multi-disciplinary approach, and participatory approach with resource sharing and involvement in order to sustain the continuity of the program.

An organization can adopt or re-design its own monitoring and evaluation scheme. In this particular program, the proposal review criteria, quarterly M&E, Agency In-House Review (AIHR) and Commodity Review (CR) resulted to the packaging of the technologies.

The over-all evaluation result is expressed in terms of the R&D studies, extension delivery system, fund support, the enterprise developed and the expected outcome which is the radiation effect.

2. Research and development/extension in industry partnership should be maintained. This is a showcase of promoting participatory approach, multi-disciplinary approach that will lead to a stronger partnership.
3. Research institutions’ support mechanism provides a massive technology promotion that leads to the utilization and commercialization of ube technologies.

4. The research institutions and the industry partnership lead to the attainment of farmer’s productivity through income generation and livelihood development in support to the government’s programs of addressing poverty, unemployment and inequity.

POLICY IMPLICATIONS

The following are policy reforms implemented by the university which are learned from the program, as follows:

First, the improvement of the Research and Extension Manual of the University. In 2003, the university revised its R&E manual in accordance with the recent development in the management of R&D Programs. The revised policies included: a.) Integration of a RDE management system; b.) Institutionalization of the R&D continuum in all the RDE program of the university in order to ensure possible technology dissemination, utilization and commercialization.

Second, the Research and Development Technology Commercialization Guidelines. As a result of the R&D continuum implementation in the university, the research and extension council prepared the R&D Technology Commercialization Guidelines and was approved by the administrative council and the Board of Regents to commercialize output of research. The guidelines covered the entire management operations which consist of: a.) program concept; b.) organization and management; c.) records and recording system; and d.) financial management. The guidelines legalize the incentives for our researchers and extension workers and provide support to the administration in terms of capital build up, employee benefit fund and scholarship, and research fund.

Third, the combination of the R&D continuum and management practices which contribute to the improvement of the scientific and managerial capabilities of the university research and extension faculty and staff. This created a balance in a well-organized R&D Program and helps transform the institution into a learning institution by combining the use of management theories in the actual implementation of yam RDE programs.
RECOMMENDATIONS

The following recommendations for research managers are provided as a result of the program:

1. Research institutions should adopt specific management system in all programs to sustain research and industry partnership that covers planning, implementation and evaluation in a very systematic manner, such as: system analysis and evaluation, system design and development, implementation and evaluation.

2. Research institutions and industry partners should utilize the R&D Continuum and must give emphasis on the role of the research, client and extension system. Research programs should follow a multi-disciplinary approach.

3. Support mechanism should be employed in order to speed up technology utilization and commercialization.

4. To attain farmers’ productivity, the combination of a management system approach, research and industry partnership and support mechanism should be institutionalized by both the research institutions and the industry partners.

BIBLIOGRAPHY


DOST. S&T Enterprise Assistance Mechanism Thru the Municipal Science and Technology Advisory Program (STEAM-MSTAP), City of San Fernando, La Union, Phils. 2000.


Ube Production. La Union Technology Packaging Committee. City of San Fernando, La Union, Philippines. February 2003.
Trip Clinic: Mangyan Participation in Natural Resource Management

Nelson A. Orfiano and Garry L. Calitang

ABSTRACT

Uniting the seven (7) tribes of Indigenous People in Mindoro is a strategic tool to achieve progress towards agreed goals on natural resources management. The lower the levels at which decisions are made and implemented, the better for synergism. This must be matched with resource allocation, responsibility and accountability.

Trip clinic (Lakbay Turo) is a mobile type of research and extension program designed to educate, organize and manage the Indigenous People, particularly Mangyans, in regards to their natural resource management endeavor.

SAPADAPA and PRA approaches were employed to scrutinize and discuss different issues pertaining to natural resource management, specifically on current situation of biodiversity, forest, agriculture, freshwater and coastal resources, and its effect to the environment. Sharing and engaging them into critical thinking and decision making were processed to change their behavior from service driven to demand driven program. Community-based resource management undertakings were done in partnership with Local Government Units (LGUs), National Commission on Indigenous People (NCIP), Department of Environment and Natural Resources (DENR), Alternative Learning System (ALS-DepEd), People’s Organization, and Plan International-San Jose.

Moreover, this is a continuing activity of Occidental Mindoro National College (OMNC) and had already done in eight (8) Mangyan communities covering four (4) municipalities of Occidental Mindoro.

---

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Occidental Mindoro National College, San Jose, Occidental Mindoro
INTRODUCTION

Natural resources management has long been known as a prerequisite for economic development in every society, thus it makes sense for governments to invest significantly in natural resource management. Communal funded research and extension then became the cornerstone in development policies all over.

Ever since, nobody questioned the existence of this scheme. Its focus was on efficiency within the system instead of alternatives, but the dilemma in communal services has channeled to immediate solutions and alternatives.

These endeavors of partnership on natural resource management in Occidental Mindoro were implemented. This was intended to provide services on a cost recovery basis by building alliances with local stakeholders and other actors on sustainable natural resource management.

Objectives

Access of information is one of the most valuable assets in development. Today, the demand for natural resource management information is stronger than ever. Events and developments far away have profound effects on the lives of human being, specifically, the indigenous people (IPs).

Hence, this research specifically aimed to:

1. Raise awareness and provide advisory on natural resource management in sustainable basis;

2. Engage indigenous people (Mangyans) into critical thinking and discussions regarding their endeavors to natural resource management much rather than simply delivering messages and inputs;

3. Change the existing manners of helping IPs through demand-driven into a certain extent than service-driven programs;

4. Enable the IPs to have social networks, learning and sharing knowledge traversing geographic and cultural boundaries; and

5. Achieve the millennium natural resource development goals in line with the global agenda.
Collaborating Agencies

- PLAN SAN JOSE. Financial assistance for food, tools and materials
- DEPARTMENT OF EDUCATION (DepEd). Formal schooling for minority children
- ALTERNATIVE LEARNING SYSTEMS (DepEd). Para teacher and community organizer
- DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR). Community Based Forest Management
- PROVINCIAL SOCIAL WELFARE AND DEVELOPMENT OFFICE (PSWDO). Food for works and medicines
- LOCAL GOVERNMENT UNIT (LGU). Peace and security of the area
- PEOPLE’S ORGANIZATION. Assist the partners in the area of operation

Implementing Agency

Occidental Mindoro National College (OMNC)

METHODOLOGY

Community-based management was done through SAPADAPA approach:

1. Situational Study and Analysis. This was the first process done to identify problems existing in the community.

2. Problem Identification and Analysis. Problems were identified, located and prescribed. Problem cause analysis and ranking according to its degree of seriousness.

3. Decision Analysis. Goal setting and appropriate actions and alternatives.

4. Expected Problem. This is to predict the potential problem to be encountered in problem solving.


RESULTS AND DISCUSSIONS

Community participation was the strategic tool done to achieve our common objective. Collaboration was proven more beneficial and effective than working autonomously. All actors had build up their understanding, recognized the process and transformed knowledge to action resolving common problems.

Trip Clinic Model is a synergism of local institutions to combat wanton exploitation of natural resources, specifically in the uplands, where most fragile binetwork are present. Upland attributes most of the landscape of Occidental Mindoro. This is where the oldest aborigines, seven Mangyan tribes: Hanunuo, Buhid, Alangan, Batangan, Ratagnon, Tadyawan, and Iraya (Tuazon, 2000) settle. From their forefathers, they had inherited the slash and burn agriculture that was further seen to be destructive in nature. Deteriorations were accelerated when the excess population from lowland encroach the upland areas. Aside from “Kaingin”, charcoal making became their primary source of income. Through this fact, the upland ecosystem in Occidental Mindoro is endangered.

Occidental Mindoro National College, the lone state college in the province of Occidental Mindoro, spearheads the program of “trip clinic”, aiming to convert the uplanders into active partners in upland restoration. Collaboration with concerned agency was also forged, and through participatory rural appraisal tools, appropriate natural resource management and conservation were identified, ranked and implemented in Sitios Bamban, Malutok, Qui-anay, Ibanag, Emok of Hanunuo Tribe; and Sitios Salafay and Bato-ili of Buhid Tribe.

Moreover, Trip Clinic was designed to three successive days’ activities: 1st day was more on researches pertaining to natural resources. Hot issues tackled were the vanishing of forests due to illegal cuttings and kaingin, which resulted to other more serious environmental problems such as the loss of biodiversity, soil erosion, landslides and flood; another was the unsustainable farming practices that resulted to low yield and income; 2nd day was program implantation (Community nursery dimension was 10 m X 10 m where fruit and endemic trees were kept); 3rd day was on community management, responsibilities, monitoring and evaluation to ensure its maintenance. Other livelihood programs were downloaded in the community as per community request.
RECOMMENDATIONS

Theoretically, the quality of solutions generated is superior to those generated by any individuals, given the assumptions that all partners have to share in the responsibility of providing the most optimal services within any situation.

Participatory approach offers individuals to interact and communicate with each other repeatedly and continuously. This is to enhance understanding roles and perspectives that affect interpersonal relationships between participants involved. To the extent, research and management must focus on related issues.

Stakeholder in this program endeavor has to work the entire range of problem solving activities. Its partnerships must extend beyond brainstorming ideas and allocating resources, monitoring, evaluating, and refining programs and services. Thus, the important benefit is that programs and innovations are implemented and maintained with integrity.
The Mushroom Industry in Central Luzon: Towards Finetuning R&D and Extension for Industry Revitalization 1

Emily A. Soriano 2

ABSTRACT

Just like in any other industry, the growth of the mushroom industry is dependent upon the favorable correlation between market demand and supply, the integration or complementation between production and R&D, the existence of supportive institutional mandates and policies, and the effectiveness of mechanisms for coordination and communication.

In the case of the mushroom industry in Central Luzon, the characteristics and dynamics among the various stakeholders indicated substantial deficiencies in all such respects. The study revealed that the mushroom industry in Central Luzon appeared stunted and in stagnation. This was evidenced by low production volume, low capitalization levels, low employment generation, and low market visibility and penetration. The core problem of the mushroom industry was the very short shelf life of mushrooms. This, and the absence of processing knowledge and skills among producers limited the volume of production to levels that can be easily marketed. But while processing played a very fundamental role towards the expansion of production and growth of the industry, very little attention was paid in this regard by both producers and R&D institutions. The industry, as it was, exhibited profitability. This profitability however did not translate into industry growth due to low re-investment of earnings among producers. Most of the producers were farmers operating in backyard scale and they lacked entrepreneurial skills and knowledge needed to operate beyond their neighborhood and vicinities. The support institutions, on the other hand, were mired in shortage of funds.

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Researcher, DA-RFU III, RIARC Station, Tarlac City
Their mushroom support activities had to double as fund-generation schemes just to exist. And all these stakeholders had no established mechanisms for communication, coordination and collaboration with each other.

From the findings of this study, therefore, producers must develop their marketing abilities and undertake aggressive and sustained market identification efforts. Earnings must be re-invested to finance not only the expansion of production but also the operationalization of applied research and product development. The LGU’s capability has to be strengthened to enable greater reach in the provision of assistance and services to producers. The focus of LGU assistance cannot be limited to production concerns. As the most accessible among support institutions, and as economic “shop stewards”, the LGU’s competency must encompass entrepreneurial development as well. The HEI’s need to engage in more R&D activities attuned to the needs of the industry. Processing and culinary development are currently of utmost priority, superseding technical researches that are focused largely on production. The NGA’s must pool their efforts for a more impact-oriented provision of assistance and services. Coordination among agencies and other stakeholders has to be formalized to go beyond a simple referral system into focused and integrated interventions that squarely address industry, as opposed to individual stakeholder, concerns.

INTRODUCTION

In the last four decades, mushroom production had been on a constant rise worldwide. Total mushroom production had increased more than 18-folds: from about 350,000 metric tons in 1965 to about 6,160,800 metric tons in 1997. The bulk of the increase occurred during the later years. During the last two decades, the button mushroom, Agaricus, accounted for over 70 percent of the world’s mushrooms. But by 2000, it accounted for only 32 percent of world production. This decline was due to the emergence of other mushroom varieties, including Pleurotus and Volvariella (Chang 1999, 2002). China and the European countries accounted for 96 percent of the world supply of mushrooms. The USA and Canada, in contrast, provided about two percent. The Philippines, in this regard, was nowhere in the map.

Pleurotus and Volvariella are mushrooms suitable for cultivation in tropical regions. Volvariella, in particular, is regarded as basically Southeast
Asian in origin. In fact, Filipinos have been consuming it in wild and cultured forms for generations. The Central Luzon region of the Philippines, with its generally hot and humid climate, easily satisfies the physical and environmental requirements for cultivation of the tropical mushrooms. And for years, mushroom cultivation has been a feature amongst the rice farmers of the area. With majority of its land planted with agricultural crops, the region offers substantial supply of substrates for mushroom cultivation.

Mushroom production has been pictured as a lucrative agribusiness venture that needs minimal capital input and provides high return on investment. Most of the raw materials required are agro-industrial wastes that can either be gathered free or bought very cheap. Anybody can learn the skills needed for production. Mushroom production thus presents a good opportunity for rural farmers and small-scale entrepreneurs to cash in on a commodity which has limited supply and which is well priced in the markets.

Statement of the Problem

During the past several years, various initiatives have been made by public and private entities to promote and develop the local production of cultured edible mushrooms. Numerous technical trainings have been conducted by national government agencies like the Department of Agriculture, Department of Science and Technology, state colleges and universities, and local government units to enhance mushroom production. Various forms of financial, technical and material assistance have also been extended to interested mushroom producers.

Yet, despite such efforts, the cultured edible mushroom industry in the region is still almost invisible except to those directly engaged in production. The availability of locally grown mushrooms in the local public markets is very sporadic and the volume appears miniscule. Where then have all the public and private investments gone? The situation of the mushroom industry is clearly a concern worth looking into.

Cardenas stated that the ultimate goal of every rural development endeavor is to help rural people overcome the constraints to productivity and profitability (Cardenas, 1989, as cited in Adion, 2000). An examination of the mushroom industry has the effect of exposing such constraints among mushroom producers and other stakeholders.

To examine the mushroom industry, several questions need to be answered. What is the state of mushroom production? What are the management and marketing situations faced by mushroom producers? What is the situation concerning delivery of support services to producers?
What are the problems/constraints faced by stakeholders and by the mushroom industry as a whole?

**Objectives of the Study**

The general objective of the study was to characterize the state of the cultured edible mushroom industry in Central Luzon and to identify factors critical to the industry's growth and development. Specifically, the study aimed:

1. To characterize the mushroom stakeholders in terms of: (i) producers: average number and age of workers, educational attainment of workers, access to formal trainings, non-production related trainings, occupational characteristics, of starting capital, and capitalization; (ii) consumers: age, gender, education, & occupation; and (iii) support institutions: mandates, human resources, financial resources, and facilities and equipment.

2. To characterize the mushroom production situation in terms of species cultivated, average production volume, regularity of production, farm-gate prices, material resources, and production facilities and equipment.

3. To describe the management and marketing situation among mushroom producers in terms of management concerns, profitability, business planning, R & D focus and innovations, marketing characteristics, and consumer buying characteristics, preferences and opinions.

4. To describe the situation on support services delivery in terms of services provided, frequency of services and clients served, and sources of technological and market information among producers.

5. To determine the problems and common areas of concern among stakeholders, and the possible measures and courses of action that would address industry problems and concerns.

**Significance of the Study**

The available literatures on the local edible mushroom industry were comprised largely of academic theses, research studies and training materials published by local research and academic institutions. These literatures showed a general focus on the technical production aspects of mushroom culture and production. And while there were some socioeconomic studies that indicated the economic viability and profitability of mushroom production, there was a lack of systematic study on the local mushroom industry as a whole.
This study therefore attempted to add additional information to the limited literature on the subject by providing an overview of the dynamics of the mushroom industry and thereby to help in understanding better its general problems and potentials.

Scope and Limitations of the Study

The study was a descriptive research focusing on the cultured edible mushroom industry, particularly Pleurotus and Volvariella production, in the Central Luzon region provinces of Nueva Ecija, Tarlac and Pampanga. Primary data were limited to information gathered from interviews and survey of study subjects composed of mushroom producers, support institutions, and consumers. Secondary data were sourced from reports of national government agencies and academic institutions.

Research Design

This study used a descriptive research design in order to provide a comprehensive account of the status of the mushroom industry in the area of study. In answering the research objectives, it used different methodologies in gathering, processing and analyzing data, namely: key informant interviews, survey questionnaires, and SWOT analysis. A review of available documents was conducted in analyzing data support institutions, while key informant interviews and survey questionnaires were used for both producers and consumers. SWOT (strengths-weaknesses-opportunities-threats) analysis was used to organize and simplify problems and concerns, as well as to obtain insights on possible strategic directions for the industry.

The study looked at the characteristics, concerns and problems of stakeholders, and at how the aggregate characteristics and interactions of players shape the current state, growth and development of the whole industry.
Sampling Technique

Due to the absence of reliable data on the number and nature of players involved in the local mushroom industry, non-probability purposive and snowball sampling was used. The table below presents the respondents of the study.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td>30 farmers, 3 enterprises</td>
</tr>
<tr>
<td>Consumers</td>
<td>30 individuals, 6 institutions</td>
</tr>
<tr>
<td>National Government Agencies (NGAs)</td>
<td>DA, DOST, DTI, DAR, DENR</td>
</tr>
<tr>
<td>Local Government Units (LGUs)</td>
<td>3 Provincial, 10 municipal</td>
</tr>
<tr>
<td>Higher Educational Institutions (HEIs)</td>
<td>TCA, PAC</td>
</tr>
</tbody>
</table>

SUMMARY OF FINDINGS

Producers

The main product of the industry was mushroom fruit. A few (9-15 percent) of the producers also produced tissue cultures, mushroom spawn and/or processed mushrooms. Half of the producers cultivated Pleurotus, and the other half cultivated Volvariella. The production of Pleurotus and Volvariella was continuous for almost all producers. The average volume of production per month was 102kg for Pleurotus, and 132kg for Volvariella. The average farm-gate prices per kilogram among producers were 150 pesos for Pleurotus and 153 for Volvariella.

Only a few (18 percent) of the producers had tissue culture laboratories. Of these, almost all had improvised inoculation chambers (94 percent), improvised sterilization containers (90 percent), and improvised tools (97 percent). Majority of producers (73 percent), which includes all Pleurotus and some Volvariella growers, had growing houses/rooms for fruiting mushrooms. The rest had makeshift sheds (27 percent). All Pleurotus growers utilized hanging spawn bags. Majority (81 percent) of Volvariella growers used fruiting beds, while some (19 percent) used fruiting shelves. Among producers, 48 percent used rice straw, and 31 percent used banana leaves. Among producers, 21 percent were able to produce tissue cultures and planting spawns on their own, while the rest (particularly Volvariella growers) had to procure tissue cultures or planting spawns. Cultures were
sourced mainly from academic institutions, commercial and governmental tissue laboratories.

All of the producers were engaged in active marketing of their produce. Almost all producers peddled their produce, directly or through paid personnel, while more than half also consigned their goods to public market stalls/vendors. Only a few producers (21 percent) sold to traders. In terms of geographic reach, majority (54 percent) of the producers were able to market within their municipality, 22 percent had marketed in neighbouring municipalities, 18 percent marketed only within their neighbourhood/village, and 6 percent had marketed their produce outside the province. Almost all (94 percent) of the producers made no effort to promote or advertise their produce.

Only 21 percent of producers had mushroom business plans. But only half of these claimed to have updated plans. Majority of producers (76 percent) did not engage in research and development activities. Those who reported having tried to experiment were mainly concerned with alternative substrates.

The major management concern of producers was marketing. Of minor concern were cost control, production quality, cash-flow management, and personnel turnover. On financial management, 30 percent of producers claimed to keep financial records. However, only 3 percent actually practised double-entry bookkeeping. The others kept simple transaction records with bare details.

There is an average of 2.25 persons involved in mushroom production among producers. The average age of these mushroom workers was 46.2 years. Among the mushroom workers, 63 percent had attained high school, 20 percent college, and 17 percent elementary education. Majority of the mushroom workers had received formal trainings on mushroom production, while the rest had “on-the-job” training. However, very few of the producers had received trainings or even seminars on marketing, financial management and general entrepreneurial management.

Only about a fourth of the producers (27 percent) were into mushroom as primary occupation. The majority of producers (73 percent) engaged in mushroom production as a secondary/supplemental income source. Most of the producers (91 percent) had started their mushroom involvement out of personal funds. Only 9 percent had start-up capital sourced from grants or loans. For most of the producers (91 percent) who started out as mere mushroom growers, the startup cost was reported as “minimal”. The producers (9 percent) that started outright with tissue culture and spawn
production, on the other hand, reported startup costs that varied depending on the sophistication of their facilities and equipment.

All of the producers reported that operations could be financially sustained out of earnings. The estimated operating expenses per month among producers averaged 7,816 pesos while the estimated monthly net income averaged 3,658 pesos. The profit margin averaged at 24 percent while the investment turnover averaged 1.83. The returns-on-investment averaged at 31 percent.

Support Institutions

Some of the support institutions also acted as mushroom producers. The SCU’s, the DA, and at least one LGU sold mushroom fruits as well as spawns and tissue cultures. The volume of production, regardless of species, ranged from 6 to 22 kilograms per week.

The services offered by support institutions differed depending on their nature. The services commonly offered were trainings and technical advisory. In addition, the LGU’s engaged in provision of material assistance, the SCU’s focused on research, and the NGA’s undertook IEC/promotional activities.

Among LGU’s, only 38 percent had specific personnel (point persons) designated to oversee or coordinate mushroom-related activities. Most LGU’s relied on the services of consultants or other institutions for mushroom trainings or technical assistance activities. All SCU’s however had specific personnel and units for mushroom-related undertakings. Among NGA’s, only the DA had a designated unit and personnel engaged in mushroom activities. The other agencies tapped the services of consultants or other institutions for rendering mushroom assistance.

In all the support institutions, financial resources were reported as very limited and minimal. There were no regular fund allocations for mushroom-related undertakings. Funding were mostly project-based and on case-to-case basis. Among LGU’s, mushroom funding was usually sourced out of general training funds and the mayors’ discretionary funds. In some cases, funds were sourced from supplemental budgets under the sponsorship of supportive councilmen/board members. Among the SCU’s, mushroom funding took the form of start-up/seed funding. Mushroom activities were designed to be income generating or self-liquidating, such as through charging of training/consultancy fees or sales of mushroom products.
Among LGU’s, involvement in mushroom was generally subsumed under the agricultural extension thrust of the municipal agriculture office. In isolated cases, however, the cooperatives development office, the public employment service office, or the urban poor affairs office, ran the involvement.

The main thrust of LGU involvement in mushrooms was “poverty alleviation”. Mushroom endeavors were seen both as alternative and as supplemental income sources for constituents.

For SCU’s, the mushroom units mainly served as an integral part of the institution’s educational mandate. The mushroom endeavors served as avenues for fulfilling the research, publication and extension work required of academic personnel, and for practicum and research work of students.

For NGA’s, the mushroom involvement fell under the purview of both socio-economic development and poverty alleviation goals of the government. However, specific mushroom interventions by each agency varied in terms of objective and scope, depending on the particular mandate of each agency. Thus, the DTI’s mushroom involvement was oriented towards entrepreneurial development, and took the form of business services provision and market-linking. The DOST was focused on technology dissemination and commercialization, and provided technical and material assistance. The DA was concerned with agro-industrial development, farm waste management and utilization of marginal lands. It was able to provide technical and material assistance as well as market-linking services.

Consumers

The average age of individual buyers of mushrooms was 47 years old. Most of these were women (63 percent), and all were married. Majority of the buyers (57 percent) bought mushrooms once a month, 33 percent bought once in over a month, and 10 percent at least twice in a month. Majority of buyers (77 percent) had purchased mushrooms from public markets, 57 percent from peddlers, and 13 percent from supermarkets and groceries. Most buyers (73 percent) used mushrooms in soups, 63 percent in vegetable dishes, 40 percent in sautéed (“ginisa”) dishes, and 13 percent as fried dumplings/burgers.

In general, a slighter greater portion of individual buyers (47 percent) indicated preference for Pleurotus mushrooms, whereas 43 percent preferred Volvariella, and 10 percent sought Auricularia. However, in terms of geographic preference, Pleurotus was preferred more in Nueva Ecija and Pampanga, while Volvariella was preferred more in the province of Tarlac.
All individual buyers preferred fresh mushrooms. However, 70 percent of buyers were willing to buy canned or bottled mushrooms, 37 percent dried mushrooms, and 7 percent processed mushrooms meals. The main considerations of buyers in deciding whether or not to buy were price and appearance. About half of the buyers (53 percent) found the price of mushrooms “moderate”, 44 percent found it “very costly”. Only a few (23 percent) of buyers found the market supply of mushrooms accessible and regular. Most buyers (67 percent) found the supply of mushrooms accessible but irregular.

The institutional buyers of mushrooms were composed of restaurants, carinderias, canteens, and hospitals. Among them, restaurants and hospitals appeared to be regular buyers due to their standardized menus. Carinderias and canteens, in contrast, were mainly irregular buyers. Restaurants usually used mushrooms as flavoring and garnishing for specialty dishes. On the other hand, carinderias and canteens tended to use mushrooms as meat extenders.

On the average, restaurants bought 2 kilograms of mushrooms daily. Carinderias and canteens, on the other hand, tended to buy 1 to 2 kilograms of mushrooms in a month. Hospitals meanwhile bought 3 to 5 kilos per week. Restaurants generally preferred the canned and imported mushrooms (usually Agaricus) that can be bought in supermarkets/groceries. In cases where fresh mushroom was needed, the restaurants made use of Volvariella mushrooms.

Restaurants cited food safety assurance as main consideration for preferring canned and imported mushrooms. Their secondary considerations were the “crispiness” and “presentation” qualities of mushrooms when cooked. Carinderias and canteens, on the other hand, chose mushrooms based mainly on price, and secondarily on menu. In the case of hospitals, the preference was for fresh mushrooms due to their “nutriceutical” properties.

**Mushroom Industry Problems and Concerns**

The problems faced by producers were contamination, spoilage, market identification, capital investment and expansion. Industry concerns meanwhile revolved around the aspects of production volume, market identification, consumer awareness, product development and processing, and entrepreneurial development.
Problems of Producers

During the interviews, producers typically enumerated a host of problems experienced in their mushroom endeavors. Most of these problems, however, were very case-specific or location-specific. Examples of these were problems about decreased charcoal availability, neighbor complaint on generated smoke or attracted insects, distant source of cultures/spawn materials, and domestic emergencies which drained cash from mushroom operations. Such problems were not discussed in this study due to their irrelevance to producers as a group.

The major problems articulated directly by the producers had to do with contamination and spoilage. To this, the author added the problems in market identification, capital investment and expansion.

Contamination

Contamination referred to the unintended intrusion of harmful organisms or substances into inoculated tissues or spawns, so as to render the tissues/spawns useless for production purposes, and dangerous for their potential of infecting other tissues/spawns.

Almost all (91 percent or 30 out of 33) producers recounted having faced problems due to tissue/spawn contamination. Even producers who simply procured tissue cultures and planting spawns had to deal with the problem. In their case, however, replacement cultures and spawns can sometimes be requested from the suppliers.

Tissue/spawn contamination was recounted by 67 percent as “occasional”, by 16 percent as “seldom”, and by another 16 percent as “frequent”. In terms of magnitude, all producers described the experienced contamination as “manageable”. None described it as “serious” or very “serious”.

The damage caused by contamination varied depending on the promptness of detection. Damage was usually felt in terms of delay in production schedule, decreased production output, and increased costs.

Spoilage

Spoilage referred to the intense degradation of mushroom fruits due to age, exposure to weather, and/or bad handling. Spoilage mainly stemmed from the relatively short shelf life of mushroom fruits. Whereas contamination
occurred in the early stages of the production process, spoilage occurred at the end of the process and during the marketing stage.

Majority of producers (73 percent or 24 out of 33) had reported experiencing spoilage. In terms of frequency, most of these (67 percent) had experienced the problem “occasionally”, while 25 percent experienced it “seldom”, and 8 percent “often”. In terms of magnitude, almost all (88 percent) experienced the problem at “manageable” level; none described it as “serious”, but a few (11 percent) described their experience as “very serious”.

Almost all of the producers (91 percent) dealt with spoilage by limiting their production volume to easily sellable levels. Some of the producers (9 percent) approached the spoilage problem by drying fruits, or by processing fruits into mushroom meals such as dumplings and burgers. None of these, however, resorted to canning or bottling of fruits for lack of facilities, equipment and know-how.

Spoilage translated directly into decreased sales for producers. And although spoilage appeared to be only occasionally and manageably experienced, the number of affected producers nevertheless implied a substantial collective loss in income, and as such warranted an urgent search for solutions.

Market identification

Although not expressly indicated in interview responses, market identification was identifiable as another major problem among producers. This problem related to either the inability or lack of initiatives among producers to seek out new markets for their products.

Almost all producers relied on peddling and public markets in marketing their produce. Half of producers marketed only within their municipality, and a fourth marketed only within the neighborhood/village. Only the remaining fourth managed to market outside their municipality into other municipalities and provinces.

This situation indicated a general complacency among producers and a lack of aggressiveness in expanding their market distribution channels and market reach.

The major constraints concerning market identification appeared to be transportation costs, risk of spoilage, limited production volume, and lack of know-how on the part of most producers.
Capital investment

Production volumes were obviously dependent on the scale of production as influenced by invested capital. Local producers with greater capital could afford, for instance, more sterilization drums to sterilize more spawn, or hire more workers to gather and compost more raw materials.

The aggregate production among respondents in this study was a meager 260kg per month, and the average mushroom production volumes (102 to 132kgs per producer) were quite low.

Given the fairly high profitability among producers, the low production appeared to be due to very low re-investment of earnings among producers. The state of facilities and equipment among producers was highly indicative of this situation.

Most of the equipment and facilities of producers dated back to the start of involvement in production. Where re-investment occurred, these tended towards (1) maintenance of facilities and equipment, and (2) improvements that were of minimal production value, such as in the case of a producer who replaced cogon roofing with GI sheets instead of adding sterilization drums for greater production.

Clearly, substantial re-investment of capital by producers was critical for the expansion of production and the growth of the industry.

Expansion

The growth of the mushroom industry was contingent on increases or expansion of production. However, majority of the producers (76 percent) indicated that their production had not substantially increased since the past year. Majority (70 percent) also did not perceive their production as increasing significantly within the next five years. A few (6 percent) were even unsure whether they would still be engaged in mushrooms five years later.

The main reason cited for the lack of increased production was perceived market saturation. Most of the producers felt that their current production level adequately meets the demand in their regular markets.

Problems of Support Institutions

Common among the producers were the problems of funding, capability, and reach.
Funding

In all the support institutions, financial resources were very limited and minimal. There were no regular fund allocations for mushroom-related undertakings, or even for mushroom-dedicated personnel. Personnel carrying other workloads usually undertook mushroom undertakings as additional tasks or designated functions. Funding, if available, was mostly project-based and on case-to-case basis. And in many cases, the mushroom initiatives were forced to transform into self-liquidating and fund-generating projects, sometimes at the expense of their “support” or “extension” mission.

Capability

The problem on capability pertained particularly to LGU’s. Majority of the LGU’s did not have personnel with technical competence on mushroom production. Even personnel with technical trainings were sometimes unsure of their skills and knowledge. Their projects were beset with the same technical problems as the ordinary producer. And in at least one case, the LGU in effect sub-contracted the mushroom project to a private producer cum consultant.

Reach

Consequent to the problems of funding and capability was the limited beneficiary/recipient coverage (reach) of support institutions. However, this problem on “reach” was aggravated by the general tendency of all support institutions to provide services directly to beneficiaries/clients.

In the past twelve months for instance, 41 percent of mushroom trainees were trained by SCU’s and NGA’s, and 51 percent were “trained” by the LGU’s. This represented an adversely skewed situation considering that there were more LGU’s and these have greater geographic coverage than SCU’s and NGA’s.

This manifested that SUC’s and NGA’s tended more to provide trainings for would-be-producers than for beefing up the capability of LGU personnel to provide trainings on their own. The LGU’s then had to continually refer training requests to SCU’s/NGA’s while remaining incapable on their own.

There was in this situation no multiplier effect that could have greatly increased the cumulative reach of mushroom support activities by all support institutions.
Problems of Consumers

Among consumers, the main problems evoked were food safety, culinary options, and pricing.

Food safety

Food safety was of paramount concern to consumers, especially first-time buyers and institutional consumers. First-time buyers and institutional consumers generally had no idea of the difference between cultured and wild mushrooms. And the spate of news reports on mushroom poisoning in the broadcast media had not allayed fears despite assurances from producers and vendors.

In some cases, institutional consumers (usually Chinese restaurants) who seemed conversant on mushrooms confessed to doubt on locally cultured ones, and preferred instead the imported canned products. In one case, a restaurant used privately imported fresh mushrooms from China and refused favorable supply offers from at least two different local producers.

Culinary options

Another problem with respect to mushroom consumption was the limited range of culinary options. For individual buyers, the options were limited to soups, ginisa, and vegetable dishes. For institutional buyers, where chefs had the resources and skill to experiment with recipes, the options were reportedly limited by the tendency of Pleurotus, and sometimes Volvariella, to appear withered and unappetizing when cooked.

Pricing

Pricing is another problem faced by consumers. Although acquired taste did much to sustain the interest of most buyers, the same buyers could not help but notice that locally cultured mushrooms tended to equal, and sometimes exceed, the price of imported canned mushrooms. They also noticed that a drop in the appearance and quality of mushrooms did not lead to a commensurate reduction in price.

Common Concerns

Beyond the problems faced by stakeholders are several salient concerns that are of immediate significance to the growth and development of the mushroom industry as a whole. These concerns revolved around the interrelated problems of production volume, market identification, consumer
awareness, product development and processing, and entrepreneurial development.

Production volume. Overall, the volume of production had been very limited and un-optimal. The producers tended to restrict production to volumes their regular markets demanded.

Market identification. Few tried to market outside their immediate neighborhood and municipalities. Their main concerns in this were spoilage and extra costs. Their regular markets, however, were not expanding.

Consumer awareness. The usual consumers tended to be of the older age groups, and there were no indications that the younger sets were acquiring the same taste for mushrooms as their parents and elders. Institutional consumers were not increasing for perceived food safety reasons and limited culinary options in mushrooms.

Product development and processing. The array of menus and recipes open to consumers was limited. There were only rudimentary research and development done on this. Most of the R&D were focused on production technicalities, and even mushroom fruit processing was largely un-attended.

Entrepreneurial development. All of these concerns, however, would have been non-existent, or at least minimal, had a critical mass of mushroom entrepreneurs emerged. Such entrepreneurs would have been not merely production supervisors, but marketing managers, R&D innovators, mushroom publicists and advocates, and business strategists. However, only limited and isolated support was made available to enable the emergence of such individuals from among the current ranks of producers.

The figure below illustrates the dynamics among these problems and indicates intervention areas that must be addressed if the industry is to grow and develop beyond its present scope.
SWOT Analyses

In addition to the enumeration of problems and concerns, SWOT (strengths-weaknesses-opportunities-threats) analyses were made in this study. The analyses were derived from the findings previously presented and from insights gained during interviews. These analyses were made in order to surface strategic considerations for the industry to serve as a further aide for the formulation of strategic recommendations pertaining to the growth and development of the industry.

Two SWOT analyses, presented as appendices, were made: for the shop level and for the whole industry. The shop-level analysis was intended mainly for producers. The industry analysis was meant to apply to the whole industry, to aid in the complementation and orchestration of thrusts and activities of all stakeholders towards addressing industry-wide concerns.

CONCLUSIONS

Just like in any other industry, the growth of the mushroom industry is dependent upon the favorable correlation between market demand and supply, the integration or complementation between production and R&D, the existence of supportive mandates and policies, and the effectiveness of mechanisms for coordination and communication.

In the case of the mushroom industry, the characteristics and dynamics among the various stakeholders indicated substantial deficiencies
in all such respects. The following are the conclusions of this study on the state of the mushroom industry.

1. The mushroom industry in Central Luzon appears to be stunted and in stagnation. This is evidenced by: low production volume, low capitalization levels, low employment generation, and low market visibility and penetration.

2. The core problem of the mushroom industry is the very short shelf life of mushrooms. This and the absence of processing knowledge and skills among producers limit the volume of production to levels that can be easily marketed, and stifle initiatives in new market identification and expansion. Processing plays a very fundamental role towards the expansion of production and growth of the industry. But very little attention is being paid in this regard by both producers and support institutions.

3. The industry, as it is, exhibits profitability. This profitability however does not translate into industry growth due to low re-investment of earnings among producers.

4. Most of the producers are farmers operating in very small/backyard scale. They are lacking in entrepreneurial skills and knowledge needed to overcome the challenges of operating beyond the bounds of neighborhood and nearby markets.

5. The support institutions, on the other hand, are mired in shortage of funds. Mushroom support activities have to double as fund-generation schemes just to exist.

6. And the various stakeholders have no established mechanisms for communication, coordination and collaboration with each other.

RECOMMENDATIONS

The growth and development of the mushroom industry depend firstly on an understanding of the dynamics between the various problems faced by stakeholders, secondly on the identification of critical areas needing immediate attention, and thirdly on the resolute implementation of effective remedial measures.

Based on the findings in this study, particularly the discussions on problems and concerns as well as the additional insights provided through SWOT analyses, the following general and specific recommendations to
overcome the problems and challenges of the mushroom industry are presented.

**General Recommendations**

Producers must develop their marketing abilities and undertake aggressive and sustained market identification efforts. Earnings must be reinvested to finance not only the expansion of production but also the operationalization of applied research and product development.

The LGU’s capability has to be strengthened to enable greater reach in the provision of assistance and services to producers. The focus of LGU assistance cannot be limited to production concerns. As the most accessible among support institutions, and as economic “shop stewards”, the LGU’s competency must encompass entrepreneurial development as well.

The HEI’s need to engage in more R&D activities attuned to the needs of the industry. Processing and culinary development are currently of utmost priority, superseding technical researches that are focused largely on production.

The NGA’s must pool their efforts for a more impact-oriented provision of assistance and services. Coordination among agencies and other stakeholders has to be formalized to go beyond a simple referral system into focused and integrated interventions that squarely address industry, as opposed to individual stakeholder, concerns. Such focused interventions, whether thematic or geographic, could enable the emergence of a critical mass of entrepreneurs that are essential to the industry’s long-term growth and vitality.

**Specific Recommendations**

The following specific recommendations are provided on the production, marketing and support services aspects of the industry.

**On Production**

The main concerns affecting production were contamination, spoilage, capital reinvestment and expansion. To meet these challenges, the following recommendations are suggested.

To address contamination, producers have to undertake consultations with specialists from HEI’s and NGA’s to ascertain causes and identify possible solutions, and adopt appropriate and adequate measures to prevent pest intrusions and pre-existing fungal contaminants in raw materials.
To address spoilage, producers should undertake continuous identification of new markets for quicker unloading of harvest and try out various packaging and handling methods.

To address the industry need for expanded production, producers should boost their production capacity and output in tandem with the exploration of new markets.

Producers should initiate the formation of a mushroom growers association to facilitate dissemination of production technology information.

On Marketing

Producers should undertake exploration of farther markets as well as non-traditional outlets/consumers such as schools, hospitals and hotels. They should conduct more promotional activities such mushroom festivals, caravans and taste-tests in malls to attract/develop new consumers.

Producers should initiate the formation of a mushroom growers association to facilitate market identification and syndicated marketing in big market outlets, as well as disseminate market information.

On Support Services

Research

The HEI’s, the DA and DOST should undertake researches on the rapid detection, control and management of contamination, on the processing, packaging and handling methods and prolonged shelf life of mushrooms, on more low-cost technology options for producers, and more culinary options for mushroom consumers.

HEI’s/NGA’s should undertake researches on consumer awareness and preferences for mushrooms in different market segments/locations.

Information Dissemination

HEI’s and NGA’s should undertake active publication and dissemination of relevant R&D results, preferably through LGU’s and possibly through the Techno-Gabay program.

NGA’s have to disseminate more information on possible financing sources, particularly grants and soft loans, among mushroom producers.
Marketing

DTI could incorporate mushrooms in its one-town-one-product (OTOP) program to aide producers in promotions and marketing.

LGU’s should assist in the conduct of promotional activities such as mushroom festivals to develop the consumer base for mushrooms, and train more personnel on the production, marketing and entrepreneurial aspects of a mushroom enterprise in order to provide comprehensive front-line technical extension services to producers.

Support Services Provision

HEI’s/NGA’s should conceptualize and implement a comprehensive and inter-agency program for the promotion and development of the industry. The program could strengthen networking among stakeholders in the areas of resource sharing, IEC activities, and R&D.

Recommended Areas for Further Study

In the course of analyses in this study, certain aspects of the mushroom industry seemed to be of particular importance in detailing the state of the industry and in charting strategic courses of action. The areas that seemed worth examining are as follows:

1. Detailed supply and demand at the provincial, regional and national levels to aide in establishing a policy framework for the industry.

2. Comparative advantage of domestic mushroom production, versus importation, to gauge the comparative advantage of local mushroom production.

3. Mortality rate of mushroom production endeavors to sharpen the content, targeting and delivery of support activities like training and financing assistance.

4. Impact of mushroom support initiatives of support institutions.
REFERENCES


Cross Cutting Approaches in Reaching Out the Indigenous People of Occidental Mindoro Through Natural Resource Management and Community-Based Livelihood Options

Susanita G. Lumbo, Mary Yole Apple M. Declaro, and Venessa S. Casanova

ABSTRACT

The Occidental Mindoro National College (OMNC) has been in the forefront in assisting the Indigenous People of Occidental Mindoro in managing their natural resources as well as in improving their livelihoods that will ensure sustainability and conservation. To achieve this, OMNC has used ecosystems-based, community-centered, and holistic approaches that link community-based livelihood options, institutional strengthening, knowledge management, gender equality, and planning through education and training conducted in 13 Mangyan communities that belong to five major tribes, namely: Hanunuo, Buhid, Batangan (Tau-Buhid), Iraya, Ratagnon, and HaGuRa (Hanunuo, Gubatnon and Ratagnon).

In the implementation of the extension activities, OMNC has maintained a cordial working relationship with other government, non-government and private organizations. The collaborating agencies have spearheaded the promotion of natural resource management trainings, which include Sloping Agriculture Land Technology (SALT), soil and water conservation, and biodiversity conservation as well as and community-based livelihood options like banana plantation, organic fertilizer production, food processing, and handicraft among the IP communities.

The knowledge and skills learned by the IPs are essential especially in light of the rapid climatic changes and their impact on natural resources.

---

1 Paper presented during the 19th PHILARM National Convention held on 21-24 April 2009 at the Mergrande Ocean Resort, Talomo, Davao City
2 Occidental Mindoro National College, San Jose, Occidental Mindoro
OMNC ensures equality across gender and vulnerable groups in the management of and benefit from the natural resources of the IP communities. Majority (51.57%) of the beneficiaries were women. This implies that many IP women are now willing to participate in the socio-economic affairs of the community.

The Mangyans have distinct cultural and social traditions in relation to the environment. Ignoring these factors may lead to failure of the interventions extended. The essence of extending different interventions is to give all stakeholders a voice in the planning and decision-making around natural resource use, as well as in ensuring equitable distribution of the benefits, while respecting traditional practices and cultural norms. This is done through consultative meetings with the “gurangons” or elders of the community and the conduct of Participatory Rural Appraisal (PRA).

RATIONALE

The island of Mindoro is a home to the Mangyans, the indigenous people whose settlements are in the uplands and near the riverbanks which also serve as their chief sources of livelihood. Their land holdings are generally small, sloping and communal. Their farm practices like the slash-and-burn method of cultivation have caused the loss of water and deterioration of soil quality resulting in low agricultural productivity.

The IPs of Mindoro have realized they too have contributed in the destruction of the environment due to their economic activities. They are convinced that things needed to be done to prevent further destructions that may result in the loss of human lives and economic resources. The traditional beliefs, which they value and cherish, however, prevent the implementation of development projects to address identified problems. This is the reason why some development workers have abandoned their desire to institute development among the Mangyan communities.

Occidental Mindoro National College (OMNC) has been in the forefront in initiating programs intended to help uplift the quality of life of the IPs. The College adheres to the working philosophy of extension that people no matter how ignorant and submerged in the quagmire of poverty are capable of looking at things critically and in improving their levels of living. This is based on the conception that people are the means and ends of development (Cardenas, 1996). Given the right motivation, the Mangyans
can be empowered to govern their lives more effectively through educational process.

**OBJECTIVES**

1. Assist the IPs in natural resource management through trainings and seminars;

2. Strengthen the participation of women in domestic and community affairs; and

3. Generate sustainable community-based livelihood options.

**METHODOLOGY**

Participatory rural appraisal in the IP communities was conducted to assess the identified communities and their resources. With the PRA results and consultation with the “gurangons,” the RDE Unit together with the community formulated workable plans, and estimated project duration, budget, and the like.

Each training-workshop had a training design for approval and funding by the Institution and collaborating agency. All extension projects were done in partnership with the concerned local government units or organizations.

The Unit had collaborated with other agencies and other development organizations for technical and financial assistance for the conduct of the different activities.

Result demonstration was the most effective extension method used especially in the trainings for community-based livelihood options like organic fertilizer production, food processing, and handicraft making.

**RESULTS AND DISCUSSION**

**The IP Communities**

Table 1 shows the different tribal communities served since 2004. They are the 13 IP communities that belong to six major tribes such as Hanunuo, Buhid, Batangan (Tau-Buhid), Iraya, Ratagnon, and HaGuRa (mixed tribe).
Table 1 also shows that majority (51.57%) of the participants were women. This implies that many IP women are now willing to participate in the socio-economic affairs in the community. Some IP women were very vocal in their opinions regarding issues and problems confronting them.

**Table 1.** The IP communities reached and number of individuals served.

<table>
<thead>
<tr>
<th>TRIBE</th>
<th>SITIO/BARANGAY/MUNICIPALITY (Occidental Mindoro)</th>
<th>PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>Hanunuo</td>
<td>Quintal, Murtha, San Jose</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Lagnas, Batasan, San Jose</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Canabang, Paciollo, Magsaysay</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Emoc, Paciollo, Magsaysay</td>
<td>31</td>
</tr>
<tr>
<td>Buhid</td>
<td>Bato-ili, Monteclaro, San Jose</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Canturay, Manoot, Rizal</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Danlog, Monteclaro, San Jose</td>
<td>65</td>
</tr>
<tr>
<td>Batangan (Tau-Buhid)</td>
<td>Poypoy, Calintaan</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Balani, Ligaya, Sablayan</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Balangabong, Malpalon, Calintaan</td>
<td>120</td>
</tr>
<tr>
<td>Iraya</td>
<td>Puricon, Balansay, Mamburao</td>
<td>42</td>
</tr>
<tr>
<td>Ratagnon</td>
<td>Bamban, Nicolas, Magsaysay</td>
<td>32</td>
</tr>
<tr>
<td>HaGuRa (Mixed tribe)</td>
<td>Pugo, Gapasan, Magsaysay</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Grand Total</td>
<td>632</td>
</tr>
</tbody>
</table>

Percent of Participants according to sex

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.43</td>
<td>51.57</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 shows the different interventions and extended technologies in the 13 IP communities since 2004. The topics of the trainings, seminars and demonstration were agriculture, environmental conservation, livelihood, health, gender, and education.

**Table 2.** Intervention introduced to the IP communities.

<table>
<thead>
<tr>
<th>INTERVENTION EFFECTED</th>
<th>TECHNOLOGIES PROMPTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Conservation</td>
<td>Nursery Establishment</td>
</tr>
<tr>
<td></td>
<td>Sloping Agriculture Land Technology (SALT)</td>
</tr>
<tr>
<td></td>
<td>Soil and Water Conservation</td>
</tr>
<tr>
<td></td>
<td>Biodiversity Conservation</td>
</tr>
<tr>
<td></td>
<td>Solid Waste Management</td>
</tr>
<tr>
<td>Livelihood</td>
<td>Banana Plantation</td>
</tr>
<tr>
<td></td>
<td>Organic Fertilizer Production</td>
</tr>
<tr>
<td></td>
<td>Food Processing</td>
</tr>
<tr>
<td></td>
<td>Handicraft</td>
</tr>
<tr>
<td>Health and Gender</td>
<td>Child Care</td>
</tr>
<tr>
<td></td>
<td>Health and Nutrition</td>
</tr>
<tr>
<td></td>
<td>Practical Cooking</td>
</tr>
</tbody>
</table>
Table 3 shows the agencies involved in the conduct of education and training in different IP communities. DA was one of the most active partners among the local government agencies. Both the LGUs and the NGOs are supportive of the programs extended to the IP community in their locality especially when they see their constituents benefit the most from the projects.

**Benefits Earned by the Lead Agency**

1. The program served as a vehicle in the strengthening of the working relationships between the College and other development organizations. This facilitated the institutions/organizations to pool resources and work together towards a common goal-- the enabling of the IP communities to become stewards of their natural resources.

2. The outputs contributed significantly in the agency performance rating (APR) and in the achievement of VMGO in Extension.

**Observed Effects of the Program**

1. Planting of forest and fruit trees in the idle lands surrounding the villages. Most Mangyan villages are barren since they prefer to till lands far from their homestead. This is because their backyard animals destroy whatever plants growing around their areas. They started to construct fences and tend their animals. Community nurseries were established.

2. Practice of organic agriculture. The Mangyans were trained in the fast and easy way of producing organic fertilizers that they use in raising their crops especially lowland rice and vegetable production.

3. Generation of livelihood. The IPs started to produce handicraft and bead products and processed food for sale using materials within the community.

4. Building of greener and cleaner villages. The Manyans used to believe that they should not plant trees because these naturally grow and replenish. The activities had increased their awareness on the importance of reforestation. They started planting after attending several seminars and trainings conducted in their community. They had used the seedlings from the established nursery. Fruit bearing trees were also planted around their individual farms. Sanitation in the village was improved as they have learned to dispose garbage properly. Farm animal manure usually found scattered everywhere were utilized for organic fertilizer production.
Table 3. Agencies/organizations involved and assistance provided in the conduct of the student-led extension activities.

<table>
<thead>
<tr>
<th>Agency/Organization Involved</th>
<th>Assistance Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Government Agencies</td>
<td></td>
</tr>
<tr>
<td>1. Department of Agriculture</td>
<td>• Provided technical assistance; they served as resource persons</td>
</tr>
<tr>
<td></td>
<td>• Provided secondary data for profiling of the community</td>
</tr>
<tr>
<td>2. Local Government Units (Mayor’s Office and Barangay Council)</td>
<td>• Provided funds</td>
</tr>
<tr>
<td></td>
<td>• Sent Barangay Health Workers during the conduct of training for women i.e. child care and nutrition</td>
</tr>
<tr>
<td></td>
<td>• Allowed free use of facilities such as training hall, chairs, tables, and sound system</td>
</tr>
<tr>
<td>3. Department of Environment and Natural Resources</td>
<td>• Provided technical assistance and seedlings for nursery establishment</td>
</tr>
<tr>
<td>4. Department of Education</td>
<td>• Helped in the conduct of PRA</td>
</tr>
<tr>
<td>5. Department of Health</td>
<td>• Provided free use of school facilities in the conduct of training, seminar, and symposium</td>
</tr>
<tr>
<td></td>
<td>• Trained IP school children in the jingle making and singing contest</td>
</tr>
<tr>
<td></td>
<td>• Facilitated the conduct of PRA in IP community</td>
</tr>
<tr>
<td></td>
<td>• Provided free use of school facilities in the conduct of training, seminar, and symposium</td>
</tr>
<tr>
<td></td>
<td>• Trained IP school children in the jingle making and singing contest</td>
</tr>
<tr>
<td></td>
<td>• Helped in the conduct of PRA</td>
</tr>
<tr>
<td>B. Non-Governmental Organization/People’s Organization</td>
<td>• Provided training funds and materials</td>
</tr>
<tr>
<td>1. Plan San Jose</td>
<td>• Sent experts in community organizing</td>
</tr>
<tr>
<td>2. Farmers’ Organizations and Cooperatives</td>
<td>• Helped in the generation of funds for the conduct of training and seminars</td>
</tr>
<tr>
<td></td>
<td>• Facilitated the conduct of training</td>
</tr>
<tr>
<td></td>
<td>• Provided training funds</td>
</tr>
<tr>
<td>3. Occidental Mindoro National College Teachers and Employees Multi-purpose Cooperative (OMINACOTEMUPC)</td>
<td>• Facilitated the entry of OMNC in Buhid communities</td>
</tr>
<tr>
<td>4. Catholic Mangyan Mission</td>
<td>• Supplied secondary data for planning and implementation of projects</td>
</tr>
</tbody>
</table>
Table 3. Continuation…

<table>
<thead>
<tr>
<th>Agency/Organization Involved</th>
<th>Assistance Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Habanan Buhid</td>
<td>• Facilitated the entry of OMNC in Buhid Mangyan community</td>
</tr>
<tr>
<td></td>
<td>• Assisted in the conduct of PRA and interventions</td>
</tr>
<tr>
<td></td>
<td>• Helped monitor projects and sustain participation of the Buhids</td>
</tr>
<tr>
<td>C. Private individuals</td>
<td>• Provided training funds and materials</td>
</tr>
<tr>
<td></td>
<td>• Provided free accommodation and transportation for OMNC instructors, students, and invited experts during the conduct of training and seminar</td>
</tr>
</tbody>
</table>

**PROBLEMS ENCOUNTERED**

1. Political interference
2. Peace and order
3. Lack of unity among the IPs
4. Dole-out mentality of the Mangyans
5. Unsustained voluntary and active participation of the IPs

**REFERENCES**


The Philippine Association of Research Managers, Inc. founded on 09 September 1989 is a private, non-stock, non-profit professional organization dedicated to the promotion and enhancement of the role of managers in improving and sustaining productivity in research.

The Association aims to promote the institutionalization of research management as a profession, a career, and a tool for the management and development in the science and technology sector and to catalyze the development of research management organization in the Philippines and the Asia Pacific Region.

The activities of the Association include the conduct of national R&D management conventions, R&D management training courses, and regional R&D management seminars.

The Association is composed of members from various government agencies (DA, DOST, DENR, and attached agencies), local government units, state colleges and universities, private agencies, non-government organizations and international institutions (from Thailand, Malaysia, Indonesia, India, and Nepal).

**Mailing Address:**

Philippine Association of Research Managers, Inc.  
c/o Philippine Council for Agriculture, Forestry and Natural Resources, Research and Development (PCARRD)  
Los Baños, 4030 Laguna, Philippines

**Phone:**  
+63 (49) 536-0014 to 20

**Fax:**  
+63 (49) 536-0016