

## **Status of Agriculture, Forestry, Fisheries and Natural Resources Human Resource in Cebu and Bohol, Central Philippines**

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**Abstract** This paper aimed to present the current status of agriculture, forestry, fisheries and natural resources (AFNR) human resource in the two (2) provinces of Cebu and Bohol, Central Philippines in order to understand the reasons in the persistent downtrend of enrollment and graduation in these sectors. Cross-sectoral investigation of the three (3) groups of respondents was conducted to in-school students, graduates and employers of AFNR. Primary and secondary data were gathered and analyzed descriptively. Findings revealed a persistent downtrend in enrollment and graduation trends for the past ten years. Intervening economic, socio cultural, issues and policies impacted negatively the enrollment in AFNR. Fisheries registered the highest rate of decline in terms of enrollment and graduates. Currently enrolled students indicate that number one reason in choosing a degree in AFNR is the provision of scholarship, while graduates indicated that they took up the course because of its popularity in their community. Future plans of respondents contradict since majority of in-school students plan to apply for job overseas, while the graduates are not currently applying for a job overseas. Majority of the employed graduates landed in local-private companies with temporary or contractual status. Employers of these graduates are distributed in the urban areas within the region.

*Keywords:* AFNR, human resource inventory, employment, enrollment trend, graduation trend

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### **INTRODUCTION**

Enrollees and graduates in agriculture, forestry, fisheries and natural resources (AFNR) and related fields registered a persistent downtrend over the last ten years. This situation if unaddressed could lead to a shortage of professionals in these sectors and may consequently threaten the nation's food security. Therefore, anyone who is concerned about his future or the future of his family, the growth of

his community, and the progress of his country must pay attention to what is happening with the current and potential human resources in agriculture, forestry, fisheries and natural resources (AFNR) sectors.

This paper aimed to present the current and potential human resources in AFNR in Cebu and Bohol in order to understand better the dwindling enrollment and graduation in the AFNR degree programs. Specifically, the study was conducted to have an environmental scanning of the trends, issues, and policies affecting AFNR human resource supply in Cebu and Bohol, determine the enrollment and graduation trends in AFNR, identify the reasons affecting education, career, and employment decisions of AFNR students and graduates, and determine the employment rate, sector and location of AFNR graduates.

### **MATERIALS AND METHODS**

Three (3) groups of respondents were employed in this study. The first group included the in-school student respondents who were currently enrolled in AFNR degree programs during the second semester of school year 2008-09. The second groups comprise the AFNR graduates from 2004 until 2008. The third groups included the employers of the AFNR graduates within Cebu and Bohol provinces. Tracking and cross-sectoral investigation of the three (3) groups of respondents were employed. Questionnaires developed by the Philippine Council for Agriculture, Forestry and Natural Resources (PCARRD-DOST) and the Philippine Institute of Development Studies (PIDS) were the primary tools of generating the needed data. Informal discussion with administrators, faculty and registrars of participating schools in Cebu and Bohol was conducted and documents on policies and programs specific for AFNR were gathered.

This study covers two (2) state colleges and universities (SUCs) and three (3) private higher education institutions (HEIs) in Cebu and Bohol (Figures 1 and 2) offering Agriculture, Forestry and Natural Resources (AFNR) degree and related programs. The SUCs include the following: Cebu Technological University (CTU) in the province of Cebu specifically the campuses of Argao, Barili, Moalboal, Carmen, Daanbantayan and Camotes, and Bohol Island State University (BISU) focusing Bilar,

Calape, Clarin and Candijay campuses in the province of Bohol. The private HEIs are: South Western University (SWU), University of San Carlos (USC), and Bohol Institute of Technology-International (BIT-Int'l) in Carmen, Bohol.

For in-school or currently enrolled students' survey, *in-situ* administrations of questionnaires were conducted in Cebu and Bohol Participating HEIs from February to March, 2009. All AFNR enrolled students during the second semester were covered by the survey except for cases in which students were absent or out of the campus on field activities.

For the graduates' survey, a total of 1,931 graduates from 2004 to 2008 were considered. From the list of all graduates from the aforementioned period, a 30% sample was identified through random sample with replacement. Stratification was done by year and per degree program. Survey questionnaires were sent to the identified respondents through snail mail or via courier. In cases that graduates are not located or did not respond, alternate samples were tracked and one-on-one interview was conducted.

Retrieved questionnaires were checked and validated through telephone interviews. Responses were encoded using Microsoft Access XP templates. Data were generated through structured query language (SQL) designed by the National AFNR Team headed by Prof. Prospero De Vera and Prof. Rizal Cruz of the National College of Public Administration (NCPAG) at UP Diliman, Quezon City. Descriptive statistics were utilized to analyze data gathered specifically, simple percentage (%), summation, ranking, and the weighted mean.

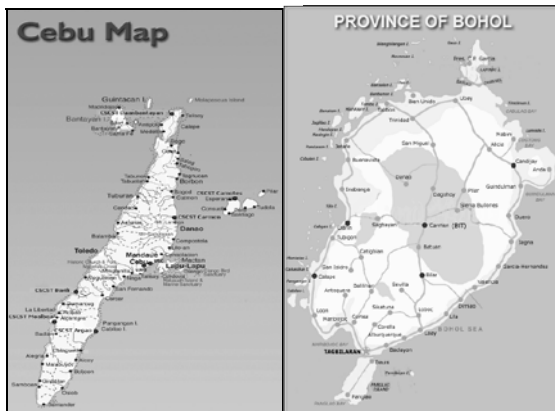


Fig. 1 and 2. Cebu and Bohol as study sites

## RESULTS AND DISCUSSION

The study involved three groups of respondents in the AFNR sector. Among the courses considered in the AFNR are the following: Agriculture, Agricultural Technology, Agricultural Engineering, Environmental Science, Fisheries,

Environmental Resources Management, Forestry, Marine Biology, Veterinary Medicine, Master of Science in Marine Biology, and Master in Agricultural Development. Participation rates, as reflected in Table 1, showed that out of the 1,035 currently enrolled or in-school AFNR students, 742 participated in the actual survey or 72%, graduates' tracer survey yielded a 27% retrieval which was quite low than the target 30% of the total graduates for the five-year period. For the employer's survey, all employers of identified graduates with current job were surveyed. One hundred eighty two or 57% of identified employers responded to the survey.

**Table 1. Respondents' participation rate from HEIs in Cebu and Bohol**

	Population (N)	Sample (n)	Surveyed	Retrieval Rate (%)
Enrollees	1035	-	742	72
Graduates	1931	580	527	27
Employers	321	-	182	57

## Environmental Scanning of Issues and Trends Impacting AFNR Human Resources

Socio-economic, cultural, policies and demographic factors influenced the recruitment and graduation trends in the AFNR sector. Based on the study of Carino in 2009 as cited by Tan, et al (2009), there is a cultural disdain of manual labor that inhibits parents from encouraging their children to take up agriculture or related fields. Informal interviews from HEI's in-charge of screening new students relayed the sentiments of parents why they do not want their children to enroll in Agriculture or related courses. Farming can be taught to their children through actual farm practice hence it is not necessary to earn a formal degree related to agriculture. If given the chance, they would opt for courses like Education, Industrial Technology or Computer related courses.

Prospects for employment opportunities also affect AFNR enrollment. Based on the findings of Arcelo (2001), graduates of Agriculture and Fisheries had a low percentage of employment consistent to academic preparation. Adding to the findings of Arcelo (2001), Daguay and Padua (2001) found out that employment opportunities for Agriculture and Fisheries graduates are not enough even if the demands by industries and government agencies are combined, now and in the foreseeable future, hence graduates of these programs are expected to be entrepreneurial.

Economic indicators delimit parents to spend extra for education. Based on statistics released by the National Statistics and Coordination Board (NSCB), poverty threshold in Region 7 increased

from Php4, 085 per month to Php5, 579 in 2006. A family of five members must earn the minimum income of Php 5,579 a month to meet its basic food and non-food requirements. Adding to that, Central Visayas has the third largest share in the total number of poor families (8.4%) in 2006. From the data in Cebu and Bohol, in-school students revealed that majority of their parents earned less than P50,000.00 annually while their fathers' occupation were primarily farming and their mothers are unemployed. Hence for this region, poverty impacted negatively in the enrollment of AFNR.

Policies on recruitment implemented by some HEI's and Licensure Examinations played a crucial factor in the choice of AFNR degree. Poor performance in licensure examinations and less job opportunities have made AFNR degree unpopular to would-be entrants. For the HEI's to attract entrants, offering other non-AFNR courses is an option, however, this creates competitions to would be takers of an AFNR degree.

### Enrollment and Graduation Trends in AFNR

The enrolment trend of AFNR is shown in Table 2, Table 3, Figure 3 and Figure 4. The BS in Fisheries started to decline from SY 2001-2002 and constantly declining until present. Among the AFNR degrees, Fisheries program posted the biggest decline (67%) in SY 2007-2008 compared to SY 2003-2004.

In fact for the Fisheries Campuses and Industrial Colleges in Cebu, there was no single student enrolled in the program for 2<sup>nd</sup> Semester of 2007-2008. Agriculture enrolment started to rise in 2000-2001 and steadily maintain a meager increase year-on-year until SY 2005-2006. However, starting SY 2006-2007 until recently, enrolment started to drop despite the efforts of some HEI's like CVSCAFT and CSCST (now BISU and CTU, respectively) to offer scholarship for students who will take up agriculture and related courses. The BS in Agricultural technology posted a fluctuating increase-decrease scenario from SY 1999-2000 to SY 2003-2004. But starting SY 2004-2005, it started to decline. For the Veterinary Medicine, the drop in enrolment was noted in SY 2002-2003 until recently. The implementation of the National Veterinary Achievement test (NVAT) impacted negatively in the recruitment of veterinary medicine students. The NVAT is the determining factor for students to proceed to third year. The BS Forestry posted a decline only in SY 2006-2007 until SY 2007-2008. The Masters in Agricultural Development (MADEV) is offered only in BISU which was in an increase-decrease scenario from SY 2000-2001 to SY 2007-2008, however, a drastic decrease was noticed in SY 2005-2006.

**Table 2. Trends for enrollment during the past 10 years**

Degree Program	School Year									
	1998-99	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Agriculture	1	20	67	300	340	373	373	325	291	267
Agricultural Engineering	93	104	35	29	51	75	70	64	54	53
Agricultural Technology	417	543	537	552	553	556	511	372	281	246
Forestry	144	164	204	161	175	178	179	166	153	112
Fisheries	450	753	889	712	646	658	629	423	206	204
Doctor of Veterinary Medicine	215	209	215	218	203	182	158	152	139	107
Environmental Science	0	0	0	0	0	0	0	0	0	10
Environmental Resource Mgt.	0	0	0	0	0	75	56	63	59	43
MADEV	0	0	26	49	35	46	20	7	8	9
Marine Biology	0	0	18	21	91	85	80	78	66	59
TOTAL	1320	1793	1991	2042	2094	2228	2076	1650	1257	1110

**Table 3. AFNR Graduation trend for the past 10 years**

Degree Program	School Year									
	1998-99	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Agriculture	0	0	31	24	23	0	57	30	39	74
Agricultural Technology	113	72	157	253	191	307	185	205	108	111
Fisheries	123	190	109	211	174	157	144	102	101	71
Forestry	44	41	20	71	38	29	25	16	48	54
Environmental Science/ Management	0	0	0	0	0	25	25	44	64	40
Agricultural Engineering	0	0	0	0	2	0	0	6	8	5
Marine Biology	0	0	0	0	5	18	6	9	22	12
MADEV	0	0	0	0	0	0	0	0	2	1
MS Marine Bio	0	0	0	0	3	0	1	0	0	2
Veterinary Medicine	16	10	17	16	25	19	20	28	20	34
TOTAL	296	313	334	575	461	555	463	440	412	404

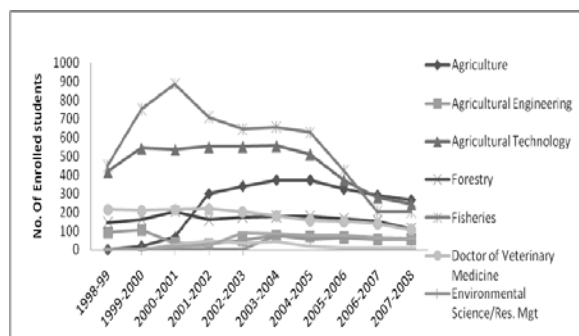


Fig. 3. AFNR enrollment trend by discipline

### Enrollment of AFNR and Non-AFNR

The disparity between AFNR degree programs compared to other degree programs are reflected in Table 4. As of the 2<sup>nd</sup> semester of 2008-2009, AFNR enrollment has a meager share of 2% of the total enrollment of the participating HEIs in Cebu and Bohol. The primary share comes from the two SUCs offering AFNR in the two provinces.

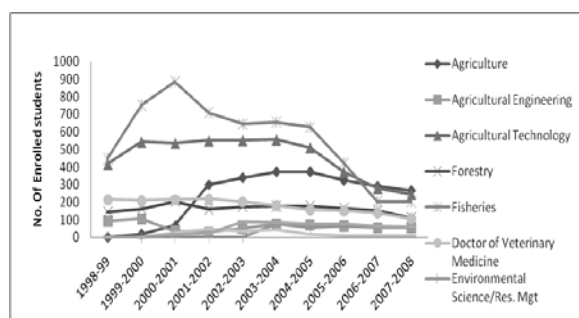


Fig. 4. AFNR graduation trend by discipline

Table 4. AFNR and non-AFNR enrollment in Cebu and Bohol, 2<sup>nd</sup> Semester 2008-2009

HEIs Covered in the AFNR Study	No. of Students Enrolled (2 <sup>nd</sup> Semester 2008-2009)	%
<b>CSCST</b>		
AFNR	457	4
Non-AFNR	12357	96
Subtotal	12814	100
<b>CVSCAFT</b>		
AFNR	399	5
Non-AFNR	7622	95
Subtotal	8021	100
<b>USC</b>		
AFNR	39	0
Non-AFNR	18352	100
Subtotal	18391	100
<b>SWU</b>		
AFNR	106	1
Non-AFNR	7497	99
<b>BIT</b>		
AFNR	34	2
Non-AFNR	1870	98
Subtotal	1904	100
<b>Grand Total AFNR</b>	<b>1035</b>	<b>2</b>

### Reasons in Pursuing AFNR Degree

The choice of a course to take up in college is shown for both in-school and graduates surveyed. As reflected in Table 5, in-school students ranked scholarship provision as the number one reason in taking up AFNR degree, followed by high grades relative to the course and parent's influence. This further implies that choosing an AFNR degree does not necessarily be a personal choice. Choosing AFNR degree is a matter of available scholarship, grades, parent's influence and affordability. This fact is supported by the number of scholarships available specifically in SUCs like CTU and BISU. In CTU, full scholarship is offered (Board of Trustees resolution no. 536 s, 2007) for students who will take up agriculture and fisheries. In addition to HEI's initiatives to attract new entrants to AFNR programs, the Commission on Higher Education Student Assistance Fund for Education (CHED-SAFE), Department of Agrarian Reform (DAR), Congressional initiatives, and many other private and individual entities offer free scholarships that include free tuition and miscellaneous fees to students. From the questionnaire, among the "Other reasons" in taking up the degree is the desire to learn how to manage the environment and to own a farm in the future (rank 6.2).

Table 5. Reasons in pursuing AFNR Degree

Reasons	Rank	
	In-school	Graduates
Provided with a college scholarship (or other means to attend college)	1	6.5
High grades in the course or subject area(s) related to the course	2	2
Influence of parents or relative	3	9
Affordable for the family	4	11.5
Good grades in high school	5	5
More job opportunities are available to AFNR graduates	6	8
Prospect for immediate employment	7	3
Strong passion for the profession	8	11.5
Prestige in our community	9	1
Influence of friends/peers	10	4
Wants to get a prestigious job	11	13
Availability of course offering in chosen institution	12	10
Opportunity for employment abroad	13	15
Others (learn how to manage the environment; and to own a farm in the future)	14	6.5
No particular choice or no better idea	15	9

Graduates were asked to rank the same set of reasons in pursuing AFNR degree. Contrary to the in-school students, graduates ranked "prestige in the community" as number one reason in pursuing a degree in AFNR. Ranked second is "high grades in the subject" relative to AFNR, which is the same as

the rank on reasons given by in-school students. "Prospect for immediate employment" ranked 3<sup>rd</sup>, "peer influence" ranked 4<sup>th</sup> and "good grades in high school" is ranked 5<sup>th</sup>.

A moderately weak agreement on ranking between in-school and graduates is not significant with  $r_s = 0.429$  ( $P > .05$ ). This further implies that choices in pursuing AFNR degree differs among in-school and graduates. It is only on the high grades in subject related to AFNR degree that student gave the same ranking.

### Plan to Apply for Job Overseas

Future plans either for career advancement or seeking for greener pasture determines the future stock of graduates in AFNR in the two provinces. Currently enrolled students were asked if they are planning to apply for a job overseas while graduates were asked if they are currently applying for a job overseas. An overwhelming 72% or 533 out of the 742 in-school respondents were planning to apply for a job overseas while 28% expressed "no intention". In contrast, majority of graduates (62%) expressed no intention to apply for jobs outside the country while 38% expressed willingness to apply.

### Employment Status of Graduates

From the identified graduates of 1,931 from SY 2004-2005 to SY 2007-2008, 527 or 27% were tracked by mail and through one-on-one interview. Out of the 527 graduates surveyed, 61% is currently employed which is composed of graduates from Bachelor in Agricultural Technology (BAT-34%), Bachelor of Science in Fisheries (BSFi-20%), followed by Bachelor of Science in Agriculture (BSA- 13%) and Bachelor of Science in Environmental Resource Management (BSERM-14%). Employability for Bachelor of Science in Forestry (BSFo) is 8%, while Marine Biology and Veterinary Medicine both have 4% employed graduates. The lowest among the AFNR degree in terms of employment of graduates is the Bachelor in Agricultural Engineering which is 2% only.

Graduates that were unemployed comprise 39% or 206 out of 527 surveyed graduates. BAT, BSFi and BSA graduates were the highest in terms of percentage of those not-employed with 30%, 21% and 19%, respectively. Forestry and BSERM followed with 12% and 11% of unemployed graduates. Marine Biology, Veterinary Medicine and Agricultural Engineering are at the bottom most with 1-2% unemployment rate (Table 6).

Staying with the job is heavily influenced by tenure status and remuneration. Of the 331 graduates currently employed, approximately 27% are tenured or regular. Contractual employees consist of 43%

(137 out of 321), while casual and temporary shared 20% and 8% of the employed graduates, respectively. There are only two (2%) percent (7 out of 321) who are self-employed. Generally, majority of employed graduates (71%) were on a contractual or temporary status.

### Occupation and Job sector

Absorption of graduates in different job sectors is shown in Table 7. Majority are employed in private-local or multinational companies with 61%. Local government and national government agencies absorb 27% or 88 out of 321 employed graduates.

**Table 6. Employment status of AFNR graduates**

<i>Degree</i>	<i>Employed (%)</i>	<i>Not-employed (%)</i>	<i>Total</i>
BSA	43 (13)	40 (19)	83
BAT	110 (34)	62 (30)	172
BSFi	65 (20)	44 (21)	109
BSFo	26 (8)	25 (12)	51
BSAE	8 (2)	5 (2)	13
BSERM	44 (14)	22 (11)	66
BSMB	13 (4)	3 (1)	16
DVM	12 (4)	5 (2)	17
TOTAL	321	206	527

**Table 7. Job sectors for AFNR graduates**

<i>Sector</i>	<i>Total</i>	<i>%</i>
National government	29	9.03
Local government	59	18.38
Education (private school)	4	1.25
Education (public)	3	0.93
Private(multinational/foreign)	50	15.58
Private(local)	147	45.79
Own firm/Business	7	2.18
Nongovernmental Organization	16	4.98
Others, please specify:	6	1.87
TOTAL	321	100.00

In terms of job classification, Table 8 shows that majority or about 30% of those currently employed have occupations that fall under technical and associate professional while 18 percent are sales worker. Included in the top five (5) occupations are other types of occupation (8%) in which graduates indicated as self employed, professional 7% while community and social /personal service activities with 6%. It is noticeable that five (5) out of 321 or 2% employed graduates are into farming, forestry and fisheries.

### Initial Gross Income

Respondents indicated their initial gross income derived from their current job. As shown in Table 9, majority of the employed graduates (86%) earn less than P10, 000 a month. Only a few (13%) earn P10, 000 and above per month.

**Table 8. Occupation of graduates**

<i>Occupation</i>	<i>No. of Respondents</i>	<i>%</i>
Technical, Associate Professional	<b>96</b>	<b>29.91</b>
Sales Worker	<b>59</b>	<b>18.38</b>
Clerk	<b>56</b>	<b>17.45</b>
Other types of occupations (self employed)	<b>26</b>	<b>8.10</b>
Professional	<b>22</b>	<b>6.85</b>
Other Community, Social and Personal Service Activities	<b>19</b>	<b>5.92</b>
Official of Government and Special-Interest Organization, Corporate Executive, Manager, Managing Proprietor	12	3.74
Laborer, Unskilled Worker	7	2.18
Farmer, Forestry Worker Fisherman	5	1.56
Military, Police force	5	1.56
Service Worker in Shop, Market	4	1.25
Plant and Machine Operator, Assembler	4	1.25
Trader, Related Work	4	1.25
Private Household with Employed Persons	2	0.62
<b>TOTAL</b>	<b>321</b>	<b>100</b>

**Table 9. Starting gross monthly income**

<i>Income Bracket</i>	<i>Total</i>	<i>%</i>
P25,000 and above	2	0.64
P20,000 to less than P25,000	3	0.96
P15,000 to less than P20,000	5	1.59
P10,000 to less than P15,000	31	9.87
P5,000 to less than P10,000	167	53.18
Below P5,000	106	33.75
<b>TOTAL</b>	<b>314</b>	<b>100.00</b>

**Employers of Graduates**

From three 321 traced graduates currently employed during the survey, only 182 or 58% of the total identified employers were retrieved. Ninety six percent (n=182) or 175 out of 182 are local companies while 4% are multinational companies. These further shows that majority of the graduates landed in a locally-owned industries or companies. The location of these employers is primarily urban (52%) while 48% operates in the rural areas. One hundred percent (100%) of the identified employers are located within Region 7 where the study was conducted. The employers outside Region 7 or in regions outside the Philippines were not tracked due to limited time and resources.

**CONCLUSIONS**

Based on the findings, the following conclusions are drawn:

1. Economic factors impacted negatively in the enrollment of AFNR.
2. Almost all AFNR degrees offered in Cebu and Bohol registered a persistent downtrend for the past 10 years. Topping the biggest rate of decline is the Fisheries program.

3. Graduation trend for AFNR degrees generally decline specifically, the Fisheries program.
4. A huge disparity in enrollment of AFNR against non- AFNR with the former constitutes only 2% of the total enrollment of all participating HIE's.
5. In-school students took up AFNR degree because of scholarship provision while graduates took up the degree because of its prestige in the community. In-school and graduates indicated different reasons in choosing a degree.
6. In terms of future employment plans, majority of currently enrolled students planned to apply for a job overseas. Contrary to the currently enrolled students, 62% of graduates are not planning to apply for a job overseas.
7. Sixty one percent of the graduates are currently employed. Majority of which (71%) holds a contractual or temporary status.
8. Majority of the employed graduates (61%) work in private-locally owned companies while more than 30% work in local or national government agencies.
9. The top five occupations include technical, associate professionals, sales workers, clerk, self employed and professionals.
10. Initial gross income of graduates ranges from below P5, 000.00 to less than P10, 000.00 per month.
11. Employers of graduates are private-local companies located within Region 7 and operate in urban areas.

**RECOMMENDATIONS**

Based on the aforementioned, the following recommendations are drawn:

1. Revitalize the Fisheries program by implementing and offering scholarships to encourage entrants to enroll.
2. Revisit and revise the agriculture and fishery curriculum to meet with the current demand of employment in region.
3. HEI's should establish linkage with industries specifically for degree programs with low entrants.

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