

The Social and Economic Impact of the Extractive Industry Job Stream in Papua New Guinea

1.0 INTRODUCTION

The Department of Mining Engineering was set up at the PNG University of Technology, Lae to train graduates for the Mineral Industry. The undergraduate teaching in the Department aim at producing quality Engineers for the Mineral Industry with basic technical, managerial and data handling skill and up-to-date information required for economic exploitation of mineral resources , maintaining high standard of safety and clean environment.



1.1 Mission Statement

The Mission of the Department is to achieve excellence in undergraduate and graduate education, research and public service.

We strive:

- Provide an educational experience that inspires students to reach for the highest level of intellectual attainment and personal growth through out their lives.
- Provide a scholarly and professional environment that enable students and faculty to make lasting contributions to the advancement of knowledge and the creative practice of engineering, particularly in the mineral sector.
- Engage in service that enhances the public's understanding of technology and facilitates its use for the betterment of society.
- Lead the nation in providing equality of opportunity for Mining and Mineral Engineering education.

1.2 Strategic Objective

The strategic objective of the Department is to be recognized as the best Engineering Department. To attain this, the Department keeps the following goals:

Goal 1: Recruit, nurture and retain outstanding students

Goal 2: Recruit, nurture and retain outstanding faculty

Goal 3: Foster innovation in engineering, research and practice , encourage entrepreneurship and promote leadership in engineering service to society.

Goal 4: Promote a strong sense of community and collegiality among the students, faculty, staff and alumnae.

Goal 5: Communicate the outstanding technological and social contributions of our faculty , staff and students to all the various constituencies of the university and to the world at large.

Goal 6: Develop and maintain an infrastructure commensurate with achieving our academic and research goals.

Goal 7: Participate and collaborate with all organizations involved in identification, exploitation, management and administration of minerals resources and issues pertaining to it.

With the above mission and vision the Department continues to fulfill its role in every Academic year in training students in Mining Engineering and Mineral Processing Engineering, in Research, consultancy and community service.

The Department also realizes that it cannot achieve its mission and vision alone; it has to work closely with the industry for support in training, sponsorship, scholarship and necessary funding support. The Department enjoys good and cordial working relationship with PNG Chamber of Mines and Petroleum which represent the industry.

2.0 DEPARTMENT'S PROGRAMMES

2.1 Undergraduate Programme

The Department offers the following programmes:

Bachelor of Engineering in Mining Engineering – 4 years

Bachelor of Engineering in Mineral Processing Engineering – 4 years

The Department admits students to the first year of these two programmes on merit basis from Grade 12 School Certificate (or equivalent) level. Strict Minimum requirements for admission are: B in Physics, Chemistry and Mathematics (Major) and C in English.

The undergraduate teaching in the Department aims at producing quality engineers for the mineral industry with basic technical, managerial and data handling skills and up –to- date information required for economic exploitation of mineral resources maintaining high standard of safety and environment.

The teaching-learning and research infrastructure and environment in the Department are being constantly updated in the laboratories housed in Mosely Moramoro Building and Kaindi Building. The Department is equipped with four Laboratories spreading over the two buildings mentioned above, the Mining laboratory, Geology laboratory, the Chemistry laboratory and the Metallurgical laboratory, all these laboratories are equipped with very good equipments and instruments for teaching and research purposes.

Students are required to undergo about 12 weeks of industrial training during the vacation. This industrial training is carried out in their third year of study, must be approved by the Head of Department and every student is required to submit a report at the end of each training period. At the final year of study students are given project topics with samples provided by the industry for research and practical testwork. They give a final presentation and submit report for assessment.

The undergraduate curriculum has been reviewed recently by an outside expert; an Emeritus Professor was brought by the Chamber of Mines and Petroleum with funding assistance from Ausaid. The Department is in the process of setting up a Course Advisory Committee for future review of its syllabus and the committee will comprise of members from within the country and abroad. This committee is yet to be finalized.

2.2 Postgraduate Programme

The Department currently runs Master of Philosophy (M. Phil) programme which starts in 2007. This is a research based postgraduate degree program to be undertaken for minimum two years full time.

The M. Phil programme is open to the following candidates;
A good Bachelor of Engineering or equivalent degree.
A M. Sc degree in Earth Science.

The university offers Postgraduate Scholarship through its Graduate Assistance Programme . Eligible Postgraduate students may also obtain Assistant Lectureship to carry out research oriented Postgraduate studies.

The research areas that the Department offers supervision include Geotechnology, Mine Planning and Design, Geostatistic, Remote Sensing and GIS application, Maintenance Management in Mining Industry, Geo Environmental Engineering, Environmental Management in Mineral Industry, Gravity Separation, Mineral Processing Technique, Tailing Management, Safety Engineering, Bulk Material Handling, Acid Mine Drainage, Drilling and Blasting, Undersea Prospecting and Mineral Economics.

3.0 ENROLMENT

Every year the Department admits students into its first year programme from Grade 12 School Leavers and some Non-School Leavers who have up graded their marks through the university's Open and Distance Learning centre (ODL) and qualified through the university's entry test. The students go through the first year and advanced through the yearly stages to fourth year and graduate after passing all compulsory university requirement with a degree.

The Department's teaching and learning facilities was design and build to accommodate 25 Mining Engineering students per class and 15 Mineral Processing students per class, this adds up to 160 students enrolling in the Department per year

3.1 Undergraduate Enrolment

Since 2008 the Department was under extreme pressure from the Government to increase the admission of first year students from the large number of Grade 12 school leavers that leave the secondary schools every year. Not only that but the much talk about industry and economy boom in the mining industry has influence many students to apply for entry into the Department. The Department received between 800 – 1000 applicants every year from both school leavers and non-school leavers.

The result was the intake into the Department has more than double putting a lot of pressure on the limited resources that we have in the Department. The current typical enrolment figures we have today would be;

Mining : Yr1 – 56, Yr2 – 51, Yr3 – 39, Yr4 – 36 = total 182

Mineral: Yr1 – 39, Yr2 – 35, Yr3 – 25, Yr4 – 27 = total 126

A total of 308 students enrolling in one year.

3.2 POSTGRADUATES ENROLMENT

The postgraduate program started in 2007 with the first Master of Philosophy (M.Phil) awarded to the first graduate in 2009. Upon graduation the first graduate has taken up a teaching position with the Department has a Lecturer in Mineral Processing, he has won a Doctor of Philosophy (PhD) scholarship in 2011 and is now currently studying at the South Australian University in Adelaide.

Our second batch of two postgraduate students have started last year 2011 and hopefully will complete their studies by the end of this year, 2012. The third batch, only one postgraduate student has already accepted and will commence her Master of Philosophy programme this year.

4.0 STAFFING

The Department has thirteen (13) established positions for Academic Staffs, a Laboratory Manager, six Technical Officers, two Secretaries and an Administrative Officer.

4.1 ACADEMIC STAFFS

The staffing level for the Department as of last year 2011, was ten Academic staff, out of this ten Academic staff seven (7) were under permanent contract with the university, two on temporary one year contract and one on part time arrangement with the industry.

The Department has experience high turnover of academic staffs since 2006, this year is no different the Department has lost five (5) of its academic staff which is 50%, three have decided to move on, one to further studies another is a part time staff working with industry and the Department is not certain whether his employer will release him again for this year or not.

National Academic staffs normally join the Department with a lot of enthusiasm in the beginning but as time wears on than reality sets in when they find they cannot sustained their families with what complements they received from the university, they quickly change their mind and move on.

Recruiting new national academic staff can be done but to train them to be teachers is a big problem. The Department needs funds and resources to send them to short courses run by other professional bodies or universities overseas to attend these short courses for one or two weeks and return to teach particular subject allocated to them although it is expensive but is a must. The Department needs to train and develop them to be specialist in one or two subject areas, this concept will maintain the standard of subject taught every year and will bring more benefit both to the Department, the staff and students.

4.2 TECHNICAL STAFFS

In the Technical area we have a Laboratory Manager who oversees the efficient running of our four Laboratories with the support of three (3) Technical Officers.

Technical staff face the same situation, the more experience have left what we have recruited are new and need more training and exposure to equip them properly before they can confidently discharge their duties. To do this the Department also needs funding and resources and support from the industries.

4.3 ADMINISTRATIVE STAFFS

The Administration area the Department has two Secretaries and an Administration Officer with the support of two cleaners for general housekeeping duties.

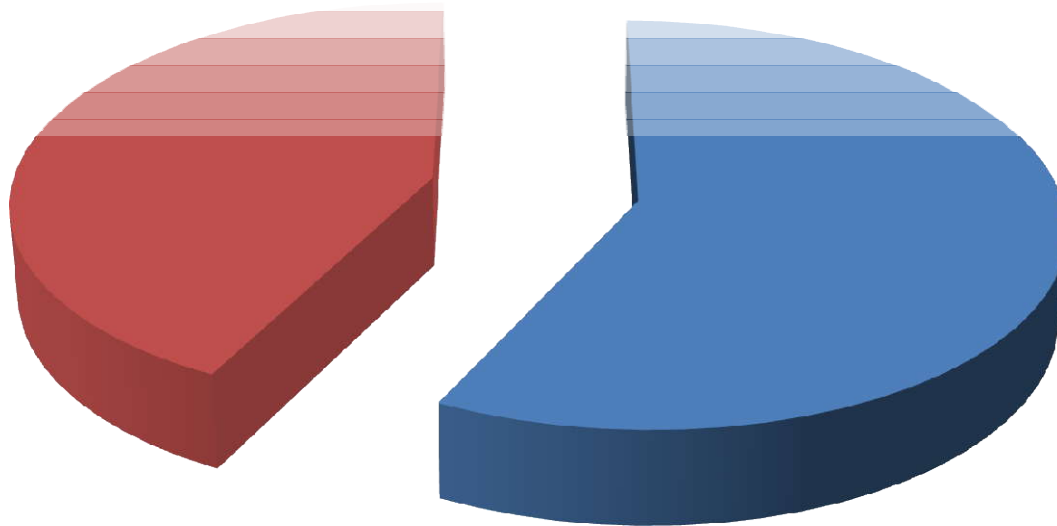
4.4 HEAD OF DEPARTMENT

The Head of Department position remain vacant since 2010, the position has been advertised and the PNG Chamber of Mines and Petroleum has been tasked to recruit an HOD with the financial support from Ausaid funding. The position is now being recognized as an Ausaid Chair.

5.0 GRADUATES

In 1978 we have the first graduates from the Mineral Processing at that time Mineral Processing was under the Department of Chemical Technology. The Department of Mining Engineering was created in 1989 and then Mineral Processing was transferred from Chemical Technology Department to the newly created Mining Engineering Department. In 1993 we have the first batch of graduates from the Mining Engineering to join the Mineral Processing graduates. The total number of graduates produced since 1978 to 2011 is about 502 graduates.

MINING ENGINEERING GRADUATES



- 1 Mining – 57 %
- 2 Mineral Processing – 43 %

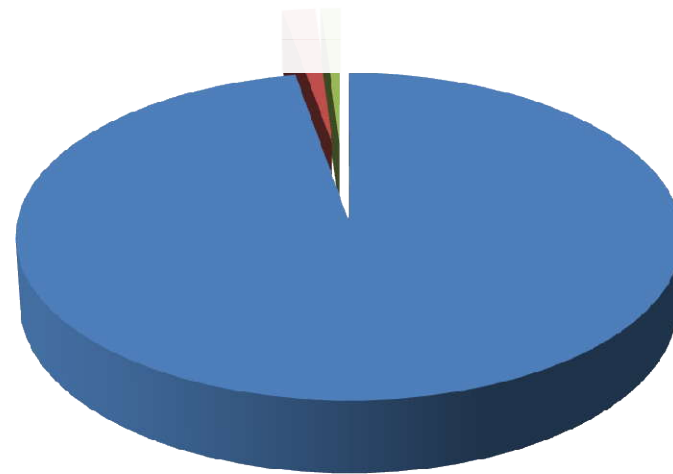
5.1 GRADUATES WITH HIGHER DEGREE

From the 502 Graduates only fourteen (14) went on to complete higher degrees in Master (MSc, MPhil) and Doctor of Philosophy (PhD). About nine (9) completed their Master Degree and five (5) with Doctor of Philosophy (PhD).

Those with Masters, only four remained with the Department, two are currently engage on study leave working towards gaining their PhD.

The five with PhD Degree, one is currently with the Department teaching, the other two are working as Assoc. Professors at universities in Japan and Sweden. The last two are working with the industry.

GRADUATES WITH HIGHER DEGREES



- 1 Bachelor degree – 97 %
- 2 Master Degree – 2 %
- 3 PhD Degree - 1 %

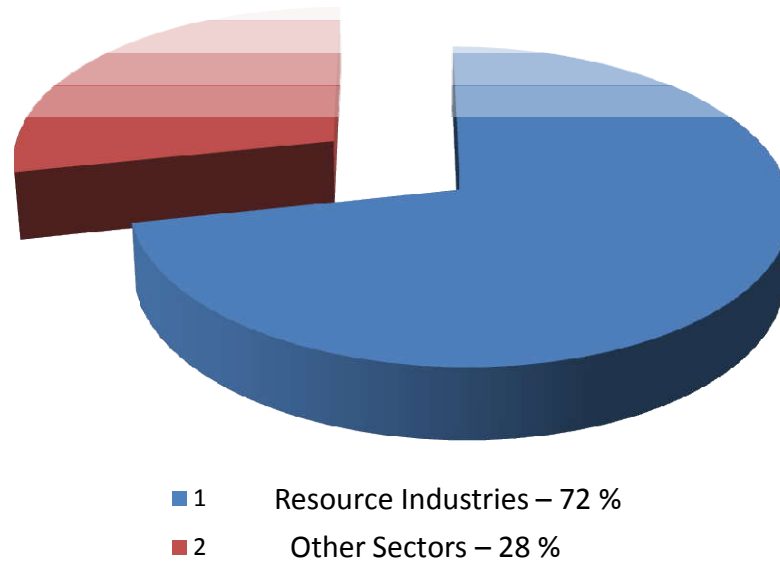
6.0 EMPLOYMENT

6.1 GRADUATES IN RESOURCE INDUSTRIES AND OTHER SECTORS

Graduates working in Resources Industries such as Mining, Petroleum and LNG compared with other Sectors such as Government or other support industries.

From 502 graduates 360 were working in the resource industries and the remainder with the Government and other support industries or other activities or deceased.

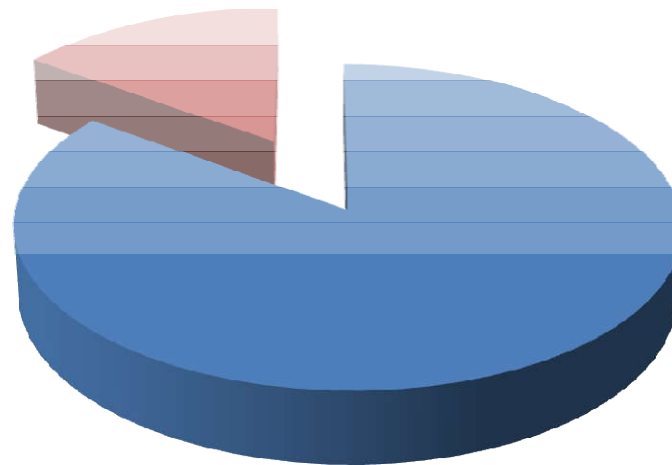
GRADUATES IN RESOURCES INDUSTRIES Vs OTHER SECTORS



6.2 GRADUATES IN MINING AND PETROLEUM/LNG

Approximately 360 graduates both Mining and Mineral were working in the Resource base industry from this 360 about 306 are in the Mining industry and 54 in the Petroleum/LNG industry

GRADUATES IN MINING Vs PETROLEUM/LNG

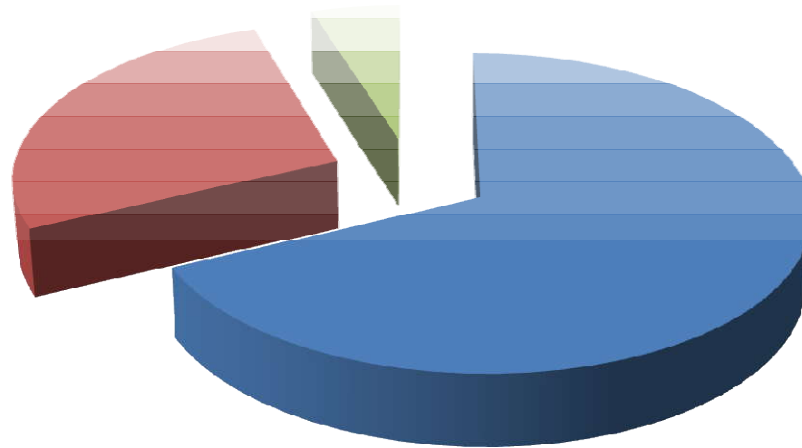


- 1 Mining – 85 %
- 2 Petroleum/LNG – 15 %

6.3 GRADUATES IN PNG MINES AND OVERSEAS

From the 306 graduates in the Mining Industry about 208 graduates working in PNG Mines and the 83 worked Australia and another 15 in other overseas countries such as New Zealand, Solomon Island, Asian region, USA & Europe.

GRADUATES IN PNG MINES, AUST. MINES & OTHER COUNTRIES



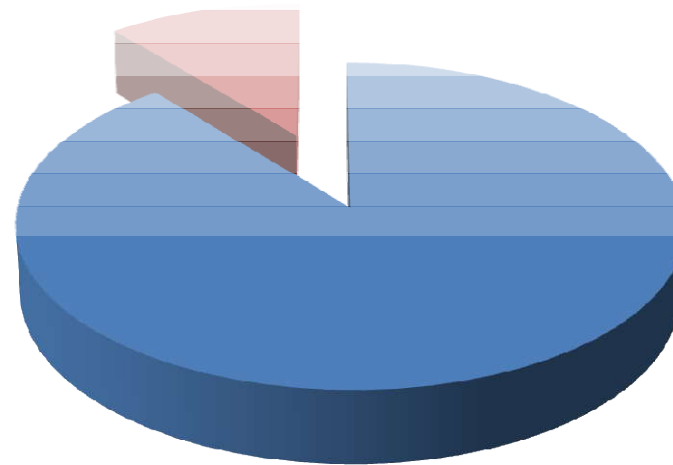
- 1 PNG Mines – 68 %
- 2 Australian Mines – 27 %
- 3 Mines in other countries – 5 %

6.4

GRADUATES AUSTRALIAN RESIDENCE WORKED IN AUSTRALIA AND IN PNG MINES

About 83 Graduates are residence of Australia, out of this 83 about 9 worked in PNG Mines.

GRADUATES AUSTRALIAN RESIDENCE



- 1 Worked in Australian Mines – 89 %
- 2 Worked in PNG Mines - 11 %

7.0 CONCLUSION

- 7.1 The Department has live up to its Mission and Vision to produce quality Mining and Mineral Processing Engineers to meet the demand of the Extractive Industry Sector (EIS).
- 7.2 The programmes for the Undergraduate and Postgraduate studies offered by the Department are internationally accepted which resulted in our graduates being competitive on the job market both nationally and internationally.
- 7.3 The intake of students is the major problem for the Department as the pressure is coming from the Government and the parents to double or triple the number of intake into the program to comply with the Governments 2050 vision; however the resources and the current facilities cannot simply enable us to meet those demands. We are finding it very difficult to place students on industrial training programmes which are a must to meet the degree requirement.
- 7.4 It is a major problem with recruiting and maintaining Academic staffs in the Department and this problem has been going on for the last four years since I have been with the Department. Soon this will eventually affect our academic program if nothing positive is done quickly to rectify the situation before it get out of control. The Department needs to recruit good staff, train them and retain them at all cost.
- 7.5 The Department has produced many good quality graduates with first degree, and the graduates are now working all over the world holding very senior positions in the organizations they work with. The Department should now focus on the Postgraduate program and work hard to produce more Masters Degree students to meet the research and development area.
- 7.6 Our graduates have basically worked in all the Extractive Industry Sector in PNG and have move abroad which is a very positive sign of an expanding job market beyond PNG shore. The experiences they gain both nationally and abroad are very valuable that they will eventually pass it on to their fellow countrymen.
- 7.7 Finally, to enable all this good things that are happening around us with constant graduates coming out of the university every year to meet the job demand and keep the cycle going we need to remind ourselves of the “Golden Goose Fable”. We need to ensure that the Gold Goose is adequately fed so that it will continue its mandated function of laying the golden eggs.

THANK YOU.