PAPUA NEW GUINEA
UNIVERSITY OF
TECHNOLOGY

ANNUAL RESEARCH REPORT

COMPILED AND EDITED BY
Professor Rajashekhar Rao BK

REPORT YEAR

2025

RESEARCH EXCELLENCE | INNOVATION FOR IMPACT | COLLABORATION AND PARTNERSHIPS | SUSTAINABLE FUTURES

This Report Contains Concise Information on Postgraduate Training, Research, and Publication Outcomes Achieved in 2025 by the Staff and Students of the Schools, and Centers of Research Excellence of the University

RESEARCH REPORT
2025

COMPILED AND EDITED BY

PROFESSOR RAJASHEKHAR RAO BK

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FOREWORD FROM THE VICE CHANCELLOR

I am pleased to note the achievements emphasized in the 2025 Research Report from the Papua New Guinea University of Technology's Faculty of Postgraduate Studies, Research, and Innovation (FoPSR&I). This report reflects a year of remarkable progress, marked by strengthened research output, the successful introduction of new postgraduate programs, and a renewed institutional focus on innovation and capacity building. We are committed to fostering a vibrant and impactful research culture, as shown by the creation of important groups like the Research, Innovation, and Development Team (RIDT) and the Student Innovations Committee (SIC), as well as funding support for research and for conference attendance by staff and students.

The accomplishments presented in this report, such as high-quality scholarly publications, postgraduate completions, international collaborations, and major conferences, show how dedicated our staff, students, and partners are. These efforts align with the Papua New Guinea University of Technology's strategic vision of advancing knowledge, fostering innovation, and contributing to national and regional development. I commend the Faculty and the Postgraduate Studies, Research and Innovations Committee for their leadership and thank all stakeholders for their continued contributions. I look forward to building on this momentum as we further strengthen University's position as a leading knowledge hub of research and innovation in the country and Pacific region.

Professor Ora Renagi, OBE

Vice Chancellor

STATEMENT BY THE CHAIRMAN OF POSTGRADUATE STUDIES, RESEARCH & INNOVATION COMMITTEE

It is with great pleasure that I present this report, highlighting the significant achievements of the Faculty of Postgraduate Studies, Research and Innovation (FoPSR&I) at the Papua New Guinea University of Technology in 2025.

The year 2025 marked a period of transformation and renewed commitment to excellence in research, innovation, and postgraduate training. Central to this progress was the proactive engagement of the newly appointed PSRI&C members, endorsed by the Academic Board. Their leadership and diligence resulted in the development and approval of several key policy frameworks that will guide and strengthen our research ecosystem. Among these were policies supporting postgraduate student participation in conferences through travel, accommodation, and registration funding; the establishment of the Research and Innovation Development Team (RIDT) as a subcommittee of PSRI&C; and the formation of a Student Innovations Committee to foster a culture of creativity and entrepreneurship among our students. In addition, a robust policy framework was developed to vet book proposals submitted to the PNGUoT Press, ensuring quality and academic rigor. The Graduate Assistance-ship Program Policy was also reviewed and revised to better support postgraduate students in their academic and research pursuits.

The collective contributions of our students, staff, and collaborating institutions—both national and international—have been instrumental in driving academic and research excellence. The University recorded a notable increase in research publications and postgraduate completions, alongside vibrant seminar series and the successful hosting of the 6th Pacific Island Universities Regional Network Conference. These achievements have laid a strong and promising foundation for sustained growth in the years ahead.

I extend my sincere gratitude to all members of the FoPSR&I community and our partners for their dedication and commitment. I look forward to building on this momentum as we continue to advance research, innovation, and postgraduate education at PNGUoT.

Professor Rajashekhar Rao BK

Chairman of PSR&IC

TERMS OF REFERENCE OF THE POSTGRADUATE STUDIES, RESEARCH AND INNOVATION COMMITTEE (PSR&IC) AND MEMBERSHIP

Responsibilities: The responsibilities of the PSR&IC encompass postgraduate studies, research, and publications.

Specific responsibilities of the committee are:

1. To formulate or review the postgraduate admission policy of PNGUoT at least once every three years.
2. To vet appointments of supervisors and thesis examiners of each postgraduate student.
3. To consider and approve examination arrangements for each postgraduate program and the results for each student.
4. To organize an annual postgraduate students' research presentation.
5. To ensure compliance of postgraduate programs with the PNG National Qualifications Framework (NQF).
6. To recommend to the Academic Board names of students eligible to graduate with postgraduate qualifications.
7. To formulate or review the research policies of the University at least once every three years.
8. To consider and approve or reject applications for research funding.
9. To consider and approve or reject applications for conference funding.
10. To edit and publish the University's Annual Research Report
11. To consider and approve the objectives of all academic publications produced under the auspices of the university for dissemination beyond the university.
12. To consider and approve the terms of reference of the editorial board for each academic publication of the university.
13. To call for and receive reports from each editorial board for academic publications of the university.
14. To consider and recommend to the Vice Chancellor's Committee for approval an annual maximum amount of funding for each editorial board.

Constitution of the PSR&IC Membership will consist of the following:

Ex Officio Members:

1. Vice Chancellor
2. Deputy Vice Chancellor
3. Pro Vice Chancellor (Academic)
4. Pro Vice Chancellor (Administration)
5. Dean of Faculty of Postgraduate Studies Research and Innovation
6. Dean of Engineering
7. Chairman, Academic Integrity and Ethics Committee

Appointed Members:

1. One person appointed by the Vice Chancellor who will be Chairperson
2. Two Heads of Department
3. Two Professors

4. One academic staff with a strong background in research from each of the Sciences, Natural Resources, Engineering, Humanities, and Built Environment faculties.

5. A postgraduate student elected by the postgraduate students

Membership: Members of the PSR&IC for the period January 1, 2023 to December 31, 2024:

Ex Officio Members:

1. Professor Ora Renagi – Vice Chancellor
2. Professor Garry Sali – Deputy Vice Chancellor
3. Professor Shamsul Akanda –Pro Vice Chancellor (Academic)
4. Professor Kaul Gena – Pro Vice Chancellor (Administration)
5. Professor Rajashekhar Rao BK, A/Dean of FoPSR&I
6. Professor Rajashekhar Rao BK- Chairman, Academic Integrity and Ethics Committee

Memberships:

1. Professor Rajashekhar Rao BK – Chairman
2. Professor Prasanna Kumar Yekula
3. Professor Raj Kumar
4. Dr. Janarthanan Gopalakrishnan
5. Dr. Adimuthu Ramasamy
6. Dr. Maysam Khoshnava
7. Dr. Rosemary Adu McVie
8. Dr. Jimmy Moses
9. Mr. Michael Winuan
10. PG Student Representative

Executive Officer: Ms Pamela Dubaba, Senior Assistant Registrar (Academic)

EXECUTIVE SUMMARY

In 2025, the Faculty of Postgraduate Studies, Research and Innovation (FoPSR&I) at the Papua New Guinea University of Technology made important contributions to the University's strategic goals by improving research performance, postgraduate training, and encouraging student-led innovation. The University was able to meet recent industry needs by successfully launching several new postgraduate programs. These included the Master of Science in Applied Chemistry, the Master of Science in Climate Change and Renewable Energy, the Master of Applied Mathematics, the Master of Applied Economics, and the Master of Science in Accounting & Finance.

Institutional support for innovation was reinforced through the establishment of the Research, Innovation, and Development Team (RIDT) as a high-level subcommittee of the Postgraduate Studies, Research, and Innovation Committee (PSR&IC). In parallel, the Student Innovations Committee (SIC), chaired by the Deputy Vice Chancellor, was formed to nurture and oversee student-driven innovations. Notable progress was also achieved in the digital transformation agenda, including the digitization and archiving of postgraduate student databases and the development of an online registration system implemented in Semester 1 of 2026 student registration cycle.

Research productivity remained strong, with a total of 133 peer-reviewed journal publications, 12 edited books, 41 book chapters, and 141 conference presentations, reports, preprints, and invited talks. These outputs also included a patent, demonstrating the faculty's growing innovation footprint. Postgraduate training outcomes were equally encouraging, with 72 students graduating in 2026, including four PhD graduates. Among these, 56 completed Master's degrees, and 12 earned postgraduate certifications in student-centered teaching.

Postgraduate enrolment reached 234 students, including 5 new PhD students and a total of 22 continuing PhD students. The new intakes comprised of 67% male and 33% female students. At the Master's level, 63% of students were enrolled in course-based programs, while 37% pursued research-focused (MPhil) pathways. The Graduate Assistance-ship Program (GAP) supported 16 students during the year, reflecting the University's continued investment in postgraduate development.

Financial investment in research increased substantially, with total funding reaching K812,256.48. Of this, 93% was allocated to research activities and 7% to conference participation. Research funding nearly doubled compared to 2024, increasing by 93.5%, highlighting a strong institutional commitment to enhancing research capacity and reducing financial barriers for students. The revised funding policy also expanded support to undergraduate and postgraduate students for conference participation and innovation dissemination.

The faculty continued to strengthen its international engagement and research culture through various initiatives. One PhD student received support to present research in China, while another PhD student was given an opportunity to undergo training in a summer institute at Fiji. The Queen Elizabeth Commonwealth Scholarships (QECS) program facilitated international student mobility, including participation from Kenya. Major academic events included the Annual Postgraduate Research Seminar, which featured 34 presenters and introduced Best Presenter Awards. The University also hosted the 6th Pacific Island Universities Regional Network (PIURN) Conference, further enhancing regional collaboration and knowledge exchange.

Capacity-building initiatives were prioritized through a five-day workshop on competitive research proposal writing, involving academic staff and national stakeholders. These efforts contributed to strengthening grant acquisition skills and fostering a more competitive research environment.

The achievements of 2025 were made possible through the strong leadership and support of the University's executive management, the dedication of academic and administrative staff, and the collaborative efforts of national and international partners. A word of thank you to Dr. Mirzi Betasolo, School of Civil Engineering for coordinating the Weekly Staff and Student Seminar events of the PSR&IC. As the Faculty moves forward, it remains committed to advancing research excellence, fostering innovation, and strengthening postgraduate education in alignment with the University's strategic vision.

Professor Rajashekhar Rao B.K.
Acting Dean, Faculty of Postgraduate Studies, Research and Innovation (FoPSR&I)

07 April, 2026

SUMMARY OF RESEARCH OUTPUTS-2025*

Faculties/Schools	Journal Articles	Edited Books	Book chapters	Seminars/ Conference Papers/ Pre-prints/ Invited talks/Reports	Patents	PG students		
						Certificate	Masters	PhD
Faculty of Built Environment								
Architecture and Construction Management	0	0	1	2	0	0	4	0
Surveying and Land Studies	9	1	4	24	0	0	3	2
Faculty of Engineering								
Civil Engineering	8	1	2	16	0	0	2	0
Electrical and Communication Engineering	15	1	16	10	0	0	4	0
Mechanical Engineering	26	3	7	14	0	0	2	1
Mining Engineering	1	0	1	5	0	0	0	0
Faculty of Humanities								
Business Studies	10	3	3	13	0	0	26	0
Communication and Development Studies	8	1	0	15	0	12	2	0
Faculty of Natural Resources								
Agriculture	6	0	0	14	0	0	8	1
Forestry	1	0	0	3	0	0	2	0
Faculty of Sciences								
Applied Physics	16	0	0	2	0	0	2	0
Applied Sciences	22	2	5	10	1	0	0	0
Mathematics and Computer Science	10	0	2	6	0	0	1	0
Centres of Research Excellence								
Centre of Excellence for Biotechnology	0	0	0	4	0	-	-	-
Centre of Excellence in Environmental Research	1	0	0	3	0	-	-	-
Total	133	12	41	141	1	12	56	4

*For counting inter-school publications, the publication is credited to the school of the author who contributed the most to the work (lead author).

FACULTY OF BUILT ENVIRONMENT

SCHOOL OF ARCHITECTURE AND CONSTRUCTION MANAGEMENT

Head of the school: Dr. Jerry walliah

Introduction

The research activities from the School of Architecture and Construction Management focus more on students' research both at the Bachelor and Post graduate level. Due to excessive teaching loads, individual research to be conducted by the academics cannot eventuate. It will eventually improve when all vacant positions are fully occupied in the near future.

Research Focus

There are various research areas of the academics within the School of Architecture and Construction Management as in the respective Staff Profiles, The Staff profile listed the Expertise and Interest of the respective academic staff.

Staff Profiles

These are the academics staffs involves in the supervision of the research in the School of Architecture and Construction Management.

Name	Designation	Research Expertise and Interests
Dr Andrew Sariman	Senior Lecturer	Tropical Architecture, Transitional Architecture, Green Architecture and PNG Cultural Heritage Hub
Dr. Raheleh Rostami	Senior Lecturer	Sustainable and Green Architecture Renewable and Clean Energy, Environmental Psychology
Dr. Meysam Khoshnava	Senior Lecturer	Construction Project Management Construction Informatics Green Materials, Building, and Infrastructure, Green and Sustainability
Dr Jerry Walliah	Senior Lecturer	Quantity Surveying, Construction Project Management, System Dynamic Modelling, Construction Cost and Value Management
Dr Winter Petilani	Lecturer II	Melanesian Architecture, Sustainable Architecture, Tropical Architecture, Vernacular Architecture
Dr. Raphael N. Uwazuruonye	Lecturer II	Sustainable Construction Management, Sustainability & Durability-Based Concrete Design, Quality Control & Non-destructive Testing, Eco-friendly & Agro-Based Concrete Materials.
Mathew Pomoso	Lecturer II	Quantity Surveying and Estimating, Building Technology, Construction Management
Magdelyne Kuluwah	Lecturer I	Construction Project Management, Construction Economics, Quantity Surveying
Clive Paigala	Lecturer I	Structures, Building Systems, Vernacular Architecture, Tropical Architecture, Melanesian Architecture, Green Architecture

Undergraduate Student Projects

Student name	Program	Project Title	Supervisor/s
Himata Tanielle	BARC 3	*Tropical Architecture and its Contribution to the Built Environment*	Dr Andrew Sariman
Humtil Justin	BARC 3	*Transitional Architecture*	Dr Andrew Sariman
Joseph Maxwell	BARC 3	*Green Architecture*	Dr Andrew Sariman
Kama Fukuin	BARC 3	*Influences and Determinants of Architecture in PNG*	Dr Andrew Sariman
Daniel Ola	BARC 3	*Proposed Unitech School of Business Studies Building*	Dr. Raheleh Rostami
Percy Seneki	BARC 3	*East Sepik Provincial Government Assembly at Wewak, East Sepik Province*	Dr. Raheleh Rostami
Laurie Valou	BARC 3	*The development of the new Customs Office, Kimbe, West New Britain Province*	Dr. Raheleh Rostami
Neil Robert Pup	BARC 3	*Redevelopment of Mt. Hagen Police Station, Western Highlands Province*	Dr. Raheleh Rostami
Ishmael Matawan	BARC 3	*Unitech School of Business Studies Building*	Dr. Raheleh Rostami
Duni PUKUPIA	BARC 3	*4-in-1 Science and Computer Lab Complex for Pabrabuk Secondary School*	Dr. Raheleh Rostami
Benjaiah Miti	BACM 4	*Effective Building Maintenance Management in the Construction Industry in Papua New Guinea*	Dr. Meysam Khoshnava
Delencia Bibiken	BACM 4	*Strengthening Papua New Guinea's Construction Industry Through the Implementation of Lean Construction*	Dr. Meysam Khoshnava
Genoveuga Ilagi	BACM 4	*Optimizing Maintenance Planning Through Integrated Project Delivery (IPD) to Enhance Life Cycle Performance of Public Buildings in PNG*	Dr. Meysam Khoshnava
Landinger Josef Batia	BACM 4	*Developing a Framework for Integrating BIM and Blockchain for Enhanced Quality Assurance in Construction*	Dr. Meysam Khoshnava
Pertson Petrus	BACM 4	*Enhancing Off Site Construction with Bim*	Dr. Meysam Khoshnava
Dyran Waiyat	BACM 4	*Enhancing Quality Control During the Construction Phase Using BIM: Challenges, Applications, and Best Practices*	Dr. Meysam Khoshnava
Gerard Lavi	BACM 4	*Causes of Cost Overruns on Construction Projects*	Dr. Jerry Walliah
Lavina Cliff	BACM 4	*Non-Excusable Delay Factors Affecting Contractor Performance in Building Construction Projects: A Case Study of Lae, Morobe Province, Papua New Guinea.*	Dr. Jerry Walliah
Renee Tibong	BACM 4	*Investigating the Effects of Inadequate Quality Management as a Leading Cause of Schedule Overruns*	Dr. Jerry Walliah

Ephraim Ausalak	BACM 4	*Factors that Delay the Production Process of Steel Fabrication Case Study: Hornibrook NGI LTD (Fabrication Division)*	Dr. Jerry Walliah
Norbert Gibson	BACM 4	*The Role of Digital Technologies in Improving Construction Site Management in PNG*	Dr. Jerry Walliah
Carpar Appa	BACM 4	*The Causes of Inventory and Materials Management Issues that Affect Construction Projects in Papua New Guinea*	Dr. Jerry Walliah
Laisebo Maniana	BARC 3	*Melanesian Architecture – Integrating Melanesian Architectural Principles into Motu Koita Assembly Office, NCD*	Dr. Winter Petilani
Philemon Taka	BARC 3	*Sustainable Architecture Incorporated with a Vernacular Approach: The Design of New Wabag District Administration Building*	Dr. Winter Petilani
Sylvester Tinemau	BARC 3	*Integrating Biophilia Design into Tropical Architecture*	Dr. Winter Petilani
Myrah Mark	BARC 3	*Tawala Vernacular Architecture – A Study of Cultural Continuity and Adaptive Design in Milne Bay Province*	Dr. Winter Petilani
Charles Steven	BACM4	*The Impact of Facility Management on Academic Performance in Student Halls of Residence*	Dr. Raphael N. Uwazuruonye
Erwin Truoba	BACM4	*Factors Influencing Quality Delivery in Construction Projects: Key Determinants, Challenges and Strategic Interventions*	Dr. Raphael N. Uwazuruonye
Jasper Kaum	BACM4	*Challenges and Opportunities in Residential Construction in Lae*	Dr. Raphael N. Uwazuruonye
Malachi Emon	BACM4	*Challenges faced by Contractors in Delivering Community Projects in Rural Papua New Guinea*	Dr. Raphael N. Uwazuruonye
TAPI JUNIOR MOREA	BACM4	*The Need for Adequate Training on Digital Technologies in Technological Institutions in PNG to Enhance Construction Project Efficiency*	Mr. Mathew Pomoso
Gedion Mitien Gabriel	BACM4	*Accessibility of Disabled Students in PNG UoT*	Ms. Magdelyne Kuluwah
Joel Pokra	BACM4	*Campus Safety and Student Satisfaction: A Built Environment Perception and Experience*	Ms. Magdelyne Kuluwah
Clyde Marum	BACM4	*Exploring Construction Tradesmen's Perception of Productivity Drivers to address existing Gaps and Enhance Labour Productivity in Lae, PNG*	Ms. Magdelyne Kuluwah
Pamela Polang	BACM4	*Assessing User Perception - Post- Retrofit Evaluation on Matheson Library of PNG UoT*	Ms. Magdelyne Kuluwah
Esau Nanagia	BARC 3	*Green Architecture*	Mr. Clive Paigala
Glen Pape	BARC 3	*Passive Design Strategies in Tropics*	Mr. Clive Paigala
Kaspar Waka	BARC 3	*Vernacular Architecture in Tropical Region*	Mr. Clive Paigala
Lorenzo Collin	BARC 3	*New Ireland Provincial Government Administration Building* *Integrating Principles of Tropical, Sustainable and Vernacular/ Melanesian Architecture*	Mr. Clive Paigala
Philip Seniela	BARC 3	*Tropical Architecture*	Mr. Clive Paigala

Postgraduate Student Projects

Student name	Program	Project Title	Supervisor/s
Peter Solian	M.Arch 2	*The PNG Cultural Heritage Hub*	Dr Andrew Sariman
Kuga Boyd	M.Arch 1	*Community Center with the Approach to Increase Social Interaction and Support Learning and Skill Sharing*	Dr. Raheleh Rostami
Elisha Nalape	M.Arch 1	*Designing a Community Police Station*	Dr. Raheleh Rostami
Andrew Purani	M. Arch 2	*Preventing Cost Overruns Factors in Project Outcomes During Preconstruction Process in the Papua New Guinea Construction Industry*	Dr. Meysam Khoshnava
Stephanie Kisokau	M.Arch 1	*BIM Implementation for Medium-Scale Construction Companies in Lae, Papua New Guinea*	Dr. Meysam Khoshnava
Donovan Akui	Master of Construction Management 1	*infrastructure development for rural areas through District Development Authorities (DDA), and the District Service Improvement Program (DSIP)*	Dr. Meysam Khoshnava
Gideon Tamian	Master of Construction Management 2	*The Effect of Change Management on Construction Projects in Papua New Guinea (Case Study –GoPNG funded projects: PNG University of Technology and Local Building Contractors)*	Dr. Jerry Walliah
Vincent Molapen Kifas	Master of Construction Management 2	*Effects of Risk Management on District Service Improvement Program (DSIP) Funds for Rural Construction Projects Delivery in Papua New Guinea*	Dr. Jerry Walliah

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Dr. Meysam Khoshnava	Reviewer	Ecological Indicators	Elsevier	2025
Dr. Meysam Khoshnava	Reviewer	Journal of Cleaner Production	Elsevier	2019- 2025
Dr. Meysam Khoshnava	Reviewer	International Journal of Strategic Property Management	Taylor & Francis	2024- 2025
Dr. Meysam Khoshnava	Reviewer	Buildings	MDPI	2022- 2025
Dr. Meysam Khoshnava	Reviewer	Waste	MDPI	2025
Dr. Raphael N. Uwazuruonye	Reviewer	Magazine of Civil Engineering	Peter the Great St. Petersburg Polytechnic University, Russia	2023-2025

Research Outputs

Book Chapters

Ame, D., & Mohamed, A. (2025). Academic transition towards digital architecture in Papua New Guinea. In *Applications of Mathematics in Science and Technology* (1st ed.). CRC Press, Taylor & Francis Group, UK. https://doi.org/10.1201/9781003606659-175

Conference Presentations

Kisokau, S., Akui, D., Sauwa, L., & Khoshnava, M. (2025, July 1–3). *Overcoming the challenges of Papua New Guinea's construction industry through the integration of Building Information Modeling (BIM) and lean construction*. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Sauwa, L., Khoshnava, M., Kisokau, S., & Akui, D. (2025, July 1–3). *Effective communication in construction contract administration: Identifying key successes and failures*. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae, Papua New Guinea.

SCHOOL OF SURVEYING AND LAND STUDIES

Head of the School: Dr. Andrew Pai

Research Focus

The school's research activities revolve around the core theme of 'Land and Allied Resources' with emphasis on their optimum utilization, management and valuation. Major focus areas include climate studies, disaster risk reduction and disaster risk management. The school is primarily involved in developing human resources adept in the holistic management of land resources and in eking out the best value out of them in a sustainable manner through coordinated research activities. The School also actively engages in research related to natural hazards and disasters, including those associated with climate change and tectonic activities, with the aim of improving disaster preparedness, risk assessment, and management strategies. Students and researchers in the school are trained with state-of-the-art geospatial technologies, including recent developments in Remote Sensing, Geographic Information Systems (GIS), Photogrammetry, Global Navigation Satellite Systems (GPS/GNSS), and modern Total Station surveying equipment, along with other digital-era geospatial tools.

In addition, the school undertakes several research and development programs such as densification of benchmark points across Papua New Guinea using advanced GPS/GNSS technologies, GIS and remote sensing applications, GIS programming, and cartographic communication through thematic mapping. Research activities also extend to property valuation, land administration, land management studies, and student-led research projects. Some specific areas are given below:

1) Climate change studies
2) Land suitability for rice cultivation in PNG using remote sensing and GIS
3) Forest biomass monitoring using remote sensing and GIS
4) Forests and societal management
5) Inventorying environmental resources
6) Disaster risk reduction / disaster risk management (DRR & DRM)
7) Urban sprawl detection
8) Groundwater mapping
9) Land use planning and management
10) Land administration studies
11) Migration studies
12) Asset valuation studies
13) Cadastral data modeling
14) Management of incorporated land groups (ILG)
15) GNSS survey and vertical adjustment of Madang network
16) GIS in customary land tenure investigation
17) RS & GIS in urban and regional planning
18) Mining and its impacts on property market
19) Residential property management
20) Public educational facility management
21) Property development process in Papua New Guinea
22) Low-income housing in PNG: challenges and opportunities
23) AHI land mobilization policy
24) Impacts on customary landowners under plantation redistribution scheme
25) Impacts & effects of special agriculture and business lease (SABL) on customary landowners
26) Causes and effects of urban land values
27) Road alignment (Horizontal/Vertical)
28) Drainage design
29) Subdivision design

30) Control surveys using GPS/GNSS
31) Local geoid study using GPS heighting on heighten MSL benchmarks
32) GPS/GNSS to cadastral surveying in PNG
33) Infrastructure development surveys
34) Geodetic control surveying using GPS/GNSS
35) ILG (Integrated Land Groups) customary land registration
36) Renewable energy needs feasibility study etc.,

Staff Profiles

Name	Position	Area of Specialization
Dr. Sujoy Kumar Jana	Professor	Hazard and Disaster Management, Resource Planning and Management, Geography and Management
Dr. Sailesh Samanta	Professor	Remote Sensing, GIS, Climatology, Geography, Natural Disaster, Disaster management, Site Suitability, Environment, Renewable energy
Mr. Wycliffe Antonio	Lecturer	GIS, Cartography, Geospatial Database modeling and development
Dr. Andrew Pai	Senior Lecturer	Property Valuation, Land Administration
Dr. Cathy Koloa	Senior Lecturer	Planning, Spatial Modeling, Hazard Management, Hydro geomorphology
Mr. Lewi Kari	Lecturer	Vegetation monitoring, Remote Sensing, GIS, Digital Image Processing, Manual Image Processing, Aerial Photogrammetry, Geography, Cartography, CAD, Web Mapping, Route Analysis
Mr. Jerry Mille	Lecturer	Land Administration, Social Mapping, ILG Creation, Land Disputes & Settlement
Dr. Tingneyuc Sekac	Senior Lecturer	Renewable and Clean Energy, Natural Resources and Disaster Management, Climatology, Rural Development Planning, Urban Planning, Remote Sensing, Geospatal Data Science, GPS, and GNSS
Dr. Rosemary Adu McVie	Senior Lecturer	Knowledge and Innovation place/spaces, Property Management, Corporate Real Estate Management, Property Valuation, and Urban and Regional Planning.
Mr. Navua Kapi	Lecturer	Engineering Surveys And Designs, Lease Surveys, Remote Sensing & Photogrammetry, Urban And Regional Planning & Subdivision, Mine Survey, Geodesy And GPS, Hydrographic Surveying, UAV Surveying, And Mapping, Deformation Monitoring, Underwater Lease Surveys, Construction Surveys, Rural and Urban Valuations, Survey Hardware and Software Maintenance and Technician, Claims and BOQ for any Engineering and Construction services
Mr. James Seniala	Lecturer	Property Valuations, Property Management
Mr. Lepani Karigawa	Lecturer	Rural Valuation, Urban Valuation, Incorporated Land Groups, Property Management, Customary Land Registration
Dr. Clifford Jr Mespuk	Lecturer	Engineering Survey, ID Survey, Drainage Hydrology
Mr. Paulus Motoro	Lecturer	Property management, Property Valuation, Property Economics/Finance
Mr. Glen Yali	Lecturer	Geospatial Forest Biomass (Carbon) Modelling & Assessment for REDD+ Implementation, Pre-exploration Mineral Remote Sensing Detection, Customary Land Boundary Survey, Spatial Data Science, Marine Remote Sensing Detection, Soil Fertility Mapping, GPS Vehicle Tracking & Telematics

Ms. Camilla Yanabis Kwaudi	Lecturer	Cartography, GIS DBMS, Web mapping
Ms. Glenda Yatu	Senior Technical officer	GIS and Remote Sensing
Mr. Heva Honeaki	Senior Technical Instructor	Hydrographic Surveying, Computer-Aided Drafting, EDM Calibration, GPS GNSS, Cadastral Surveying, Automated Surveying
Mr. Adward Buidal	Principal Technical officer	Certified UAV Pilot (Drone Pilot), Surveying Profession, specifically Mining and Civil Engineering Survey, Cadastral Surveying.
Mr. Joe Yapakae	Senior Technical officer	Cadastral Surveys and Engineering Surveys
Dr. Richard Stanaway	Associate Professor	Monitoring tectonic hazards using GNSS, geodetic reference frame modernization in PNG and GNSS surveying
Mr. Jeffery Petrus	Lecturer	Property Valuation, Property Management, Land Taxation, Property Investment
Ms. Resila Karipal	Lecturer	Surveying, Land Studies, and Geomatics

Undergraduate Research Projects

Year 4 BGIS Program

Name	Project Title	Supervisor
Steward Alex	*Multi-Temporal Analysis of Bank Erosion and Accretion Using High-Resolution Imagery: A Case Study of Bumbu River in Lae City, Morobe Province*	Dr. Koloa
Leilani Aro	*Using Geospatial Technologies to Evaluate the Role of Healthy Vegetation in Urbanized Areas: A Case Study Lae City, Morobe Province*	Mr. Kari
Teicha Grace Aseari	*Spatial Analysis of Change in Biodiversity Assessment Using Remote Sensing and GIS - A Case Study of the Managalas Conservation Area in Northern Province, PNG*	Mr. Kari
Ila Aufa	*Estimating Surface Run-off in Lae Urban Area Using GIS and Remote Sensing*	Dr. Stanaway and Dr. Koloa
Dinah Avoha	*Geospatial Analysis Applications in Rural Development Planning: A case study evaluating public service accessibility in Kerema District, Gulf Province*	Mr. Antonio
Pepetua Bellem	*Mapping Ranuhedadi Customary Land in Central Province using GIS Technologies and PGIS (Participatory Geographic Information Systems)*	Mrs. Kwaudi
Leslie Benny	*Land Use and Land Cover Change Detection Using Satellite Imagery of Lae and surroundings*	Prof. Jana
Ezra Chiru	*Using Remote Sensing Techniques to Monitor and Assess the impacts of Environmental changes on temperature levels within Lae, MP*	Prof. Samanta
Franky Epe	*Establishing Database Management System For Modilon General Hospital Facilities*	Mr. Antonio
James Gela	*Hydrology Analysis for New Britain Palm Oil Mosa Area, West New Britain Province, Papua New Guinea: Enhancing Water Management*	Mrs. Kwaudi

Nelly Rose Gham	*Urban Expansion Mapping of Alotau Town Using GIS and Remote Sensing Techniques*	Prof. Jana
Goiye Boting Gande	*A change assessment on urban informal settlement using GIS and RS Techniques.A case study of Madang Block, Lae, Morobe Province*	Dr. Koloa
David Jessy	*Using GIS and Remote Sensing to Upgrade and Run Maintenance on Local water supply dam in Massi Village Goroka, EHP*	Dr. Koloa
Theresa Kautete	*Evaluating Remote Sensing DEMs (GeoSAR, SRTM,and LiDAR) of Lae City using GNSS ground validation.*	Dr. Stanaway and Mr. Kari
Carl Niumar	*Geospatial Assessment of Coastal Vulnerability and Shoreline Mapping: A Case Study of DCA Beach Front, Lae, Morobe Province*	Dr. Koloa
Moses Parale	*Change Detection using Satellite Imagery—A Case Study Lae Eriku To Lae Unitech, Morobe Province*	Mr. Antonio
Anna Rodney	*Water Distribution Network Mapping using Geospatial Techniques. (Case study: PNG Unitech Campus)*	Dr. Sekac
Hezron Roneka	*Electricity Fault Detection & Outage Management using GIS/RS Techniques in Unitech Residential Area*	Dr. Sekac
Telepo Anis	*Application of Geographical Information Science and Remote Sensing Techniques in Locating Suitable Sites for Solid Waste Disposal in Urban Areas*	Dr. Sekac
Bobby Ula	*Development of a spatial database for Geodetic Control Points at PNG University of Technology*	Mr. Kari and Dr. Stanaway
Wariupa Loiusa	*GIS-Based Analysis of Ambulance Accessibility and Response Time in Alotau's Urban and Near-Urban Communities*	Mrs. Kwaudi
Nahina Yapi	*Using GIS and RS to Assess the Extent of Deforestation Caused by Oil Palm Agricultural Expansion and Timber Harvesting in the Western Part of Huhu LLG, Milne Bay Province*	Prof. Samanta

Year 4 BPST Program

Name	**Project Title**	**Supervisor**
Nannette I Kini	*Analyzing the impact of Capitalization Rates on Sales and Rental Rates in the Property Market of the National Capital District (NCD): The Case of the 5 Suburbs in NCD*	Dr. Andrew Pai
Daniel Baine- k	*Assessing Potential Development for a Fitness Facility Center in PNG University of Technology*	Mr. Jerry Mille
Bellie-Joan Nalong	*Impact on Green policies on Commercial Property Value in Lae city*	Dr. Andrew Pai
Lorraine Serok	*Exploring Impact of the Industrial Property Market and its Impact on the Economy of Papua New Guinea: A Study on Port Moresby Industrial Rental Market*	Dr. Rosemary Adu McVie
Rose Essy	*Exploring the unique challenges and Strategies for Managing Mix-Used Property in Lae City, Papua New Guinea*	Mr. James Seniela
Aboluwe Senavo	*Impact of Inflation on the Value of Both Residental and Commercial Properties in PNG. A Case Study of the Lae City.*	Mr. James Seniela
Rejoyce Vitata	*Assessing Informal Settlements for Integration to the Existing Urban Framework: The Case of Burns Peak Hohola, Port Moresby*	Dr. Rosemary Adu McVie
Donnie Joel	*Assessment of the Effectiveness of Lae City's Existing Urban plan*	Dr. Rosemary Adu McVie

Nelson Paraka	*Analyzing Trends in Residential Rental Prices for Medium to High Covenant Properties in Selected Suburbs of Port Moresby*	Dr. Rosemary Adu McVie
Amenda Mek	*Assessing the Land Use and Zoning of Mt. Hagen City: A Review of the Redevelopment Plan*	Mr. Paulus Motoro
Keziah Andrias	*Assessing the Land Use and Zoning on Property Taxation in PNG: Case Study of Lae Top Town*	Mr. James Seniela
Wati Yanari	*Analysis of the Impact of the Land Value along Lae-Nadzab Road: Before and After the Lae-Nadzab Urban Development*	D. Andrew Pai
Nathaniel Norikgu	*The Impact of the Unregulated Real Estate Development on Urban Planning and Infrastructure Development: A case Study of Port Moresby*	Mr. Jerry Mille
Avaka Apiku	*Assessing the Performance of Corporate Real Estate in Papua New Guinea Airports: The Case Study of Goroka Airport*	Dr. Rosemary Adu McVie
Mirriam Dibul	*The Impacts of Nadzab Tomadachi International Airport on the Property Market in Nadzab Town and the Surrounding: An Analysis of Demand on Commercial Properties as a Result of the Development*	Dr. Andrew Pai
Solomon Mon	*Long-term Tension over Nadzab Airport Redevelopment Plan and Airport City*	Mr. Paulus Motoro
Abel Niru	*An Assessment of the Existing Transport Amenities and its Impacts on the Social and Economic Well-being of the Urban Population: A Case of Lae City, Papua New Guinea*	Mr. Paulus Motoro
Leroy Nui	*Identifying Potential Housing Sites for Middle Income Public Servants in NCD, Port Moresby*	Mr. Paulus Motoro
Andrew Talingapua	*Pendulum Migration and its Effects on Urban Housing in Kimbe, PNG: Identifying Transit Facilities as a Sustainable Solution*	Mr. James Seniela
Nasangat Kiapin	*Identifying Effects of Household Income Rates to Housing Affordability: A Case Study of Lae City Private Residential Market*	Mr. James Seniela
Jamie Apini	*Exploring the Potential of Digitizing and Publicizing Land Ownership: The Case of Registered Land in PNG Urban Settings*	Mr. James Seniela
Johnson Pakane	*The Assessment of Challenge Faced by Valuation Practitioners in Papua New Guinea*	Mr. James Seniela

Year 4 BSVY Program

Names	**Project Title**	**Supervisor**
Benjamin Tiolam & Zedekiah Fihaio	*Geoid validation for Lae City*	Mr. Karipal
Pamela Tarcusy & Hellen Iyapeng	*Levelling of Lae Tide Gauge BM Network - Refining of Sea Level Monitoring (Lae Shipping Port)*	Mr. Karipal
Petronila Peter	*Design and Development of Localised Projection Grids for Cadastral and Mining Surveys in Papua New Guinea*	Dr. Stanaway
Sailas Aiwa & Joab Kurua	*Proposed roundabout design to ease traffic congestion at the Y-Junction between Bumbu and Milford Haven Road*	Mr. Peya
Jackson Johnny & Philemon Fezamo	*Integrated Road design and Subdivision for Ramu Drive to Rain Forest Habitat, Unitech portion 453*	Mr. Peya
Zechariah Wambi & Jane Namieta	*Flood & Erosion Effect on Cadastral/Land Use/Land Cover: Case study of Bumbu River- from Polytech South East Edge to Cassowary Road Entry*	Mr. Peya

Xavier Tremani & Morris Jeremiah	*DTM Survey and Proposed Drainage Design for Ten City Stage 2 Suburb*	Mr. Peya
Paul Muek & Nathaniel Kare	*DTM Suvey and Proposed Drainage Design for Intersection of Sepik Drive and Sarawaged Road, Unitech*	Mr. Peya
Simeon Johnson & Gallie Tsigoto	*Identification Survey (ID Survey) of Independence Drive from Unitech Main Gate to Limki Corner*	Mr. Yapakae
Roger Pusili & Lava Serei	*Grading (Volume Calculation) of the Unitech Dump Area for Possible Construction of New Residential Area*	Mr. Yapakae
Oxcy Ehaty & Rayven Jonathan	*Updating the Elevation of Mt. Wilhelm*	Dr. Stanaway
Pande Friel & Mawe Apa	*Establishment of Permanent Ground Control Points (GCPs) Network around City of Lae*	Dr. Stanaway
Frank Kipoi & Kelly Nerius	*Densification of the PNGUoT Survey Control Network*	Dr. Stanaway
Greg Sevi & Jonathan Apul	*Densification of the Geodetic Control Network between Limki and Bumayong*	Dr. Stanaway
Gregory Ramos & Karoiwa Jack Karo	*Densification of the Geodetic Control Network between Kamkumung and Limki*	Dr. Stanaway
Freda Leyagon & Joanne Bauri	*Deformation Monitoring of the RMFZ between Unitech and Hobu*	Dr. Stanaway
Steward Maleo	*Calibration of Electronic Distance Measurement (EDM) Baseline at Unitech*	Mr. Yapakae

Postgraduate Student Projects

Name of the Students	Program	Title	Supervisor(s)
Imen Ite Papa	PhD/4	*Social and Economic Benefit Sustainability of the Impacted Communities of the Mining Project in Western Province, PNG: A Case Study of Ok Tedi Mine*	Dr Andrew Pai Dr. Rosemary Adu
Nebare Poi	PhD/4	*Web-Based Spatially Integrated Information Management System for Effective Administrative Functions*	Professor Jana Dr. Sekac
Japena Elawi	MPhil/2	*Geospatial Approach in Detecting Afforestation and Deforestation over the period 2000-2024 to determine its impact on the carbon sequestration process*	Dr. Sekac
Jeremiah Renagi	MPhil/2	*Geomatics Application in Rooftop Solar PV Potential Mapping: A Case Study in the Papua New Guinea University of Technology*	Dr. Sekac
Theresa Oboko	MPhil/2	*Integrating Web-based GIS for Building & Land Assets Management System for Lae Urban Municipality, Lae District: A Case Study for Ward 2*	Mr. Lewi Kari Ms. C. Yanabis

Major Professional Recognitions, Accomplishments and Awards

Name of the staff	Designation	Award/ recognition	Awarding body	Level (National/Regional/ International)

Sailesh Samanta	Professor	CASSINI Jury Member	European CASSINI Hackathon, University of New Caledonia (UNC)	International
Sujoy Kumar Jana	Professor	Guest of Honor	International Conference on Sustainable Developments in Computer Engineering, Green Technology & Smart Systems (ICSDS-2025), Hooghly, West Bengal, India	International
Sujoy Kumar Jana	Professor	Technical Session Co-Chair	4th International Symposium on Disaster Resilience and Sustainable Development 2025, AIT, Thailand	International

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Sailesh Samanta	Editor	Melanesian Journal of Geomatics and Property Studies	School of Surveying and Land Studies, PNGUoT	2015 - 2025
Sailesh Samanta	Associate Editor	Spatial Information Research	Springer	2017-2025
Sailesh Samanta	Reviewer	Natural Hazard Research, International Journal of Disaster Risk Reduction, Journal of Hydrology, Results in Earth Science, Egyptian Journal of Remote Sensing and Space Science, Discover Geoscience, Environmental Earth Science, International Journal of Geoinformatics, International Federation of Surveyors etc.,	Elsevier, Springer, Springer Open/ MDPI, FIG	2025
Sujoy Kumar Jana	Guest Editor	Geological Journal Special Issue on “Climate Change and Geohazards: An Introduction”	John Wiley & Sons	2025
Sujoy Kumar Jana	Reviewer	International Journal of Geosciences, Modeling Earth Systems and Environment, Environmental Science Europe, American Journal of Geology, Sustainability in Resources Management, Journal of Environmental Management	Elsevier/Springer	2025
Sujoy Kumar Jana	Editorial Board Member	Melanesian Journal of Geomatics and Property Studies	School of Surveying and Land Studies, PNGUoT	2015-2025

Funded Staff Research Projects

Adu McVie, R., Koloa, C., & Kwaudi, C. (2025–Present). *Classifying knowledge and innovation places in Papua New Guinea: Adoption of a modified innovation district classification framework*. Collaborative research project, School of Surveying and Land Studies, Papua New Guinea University of Technology. Role: Research team. Funding agency: Postgraduate Studies, Research and Innovation (PGSR&I), PNG University of Technology. *Status:* Pilot study completed; subsequent project phases ongoing.

Samanta, S., & Sekac, T. (2021–Present). *Better soil information for improving PNG's agricultural production and land use planning: Building on PNGRIS and linking to the Pacific Regional Soil Partnership* (Project No. SLAM2019/106). Collaborative research project funded by the Australian Centre for International Agricultural Research (ACIAR). Role: Team member.

Stanaway, R., Pai, A., Bakus, J., Paraka, J., Honeaki, H., Suat, J., Kari, L., Kapi, N., Mespuk, C. J., Bonga, M., Peya, N., Nidkombu, E., Gawi, L., Buidal, E., Ismael, S., & Yapakae, J. (2025). *Lae, Papua New Guinea seismic hazard study: GNSS geodetic survey* (Final technical report). Funded by Geoscience Australia.

Research Outputs

Journal Articles

Ape, J., Bathula, S., & Samanta, S. (2025). An assessment of the effects of groundwater quality parameters in proximity to the open dump site in the perimeter of PNG University of Technology. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(1), 42–57. https://doi.org/10.63900/gzsxac45

Ape, J., Bathula, S., Samanta, S., & Kotra, K. K. (2025). Assessment of toxic metals in an open dump site near PNG University of Technology, Papua New Guinea. *Nature Environment and Pollution Technology, 24*(2), Article D1713. https://doi.org/10.46488/NEPT.2025.v24i02.D1713

Karipal, R., Kari, L., & Yanabis Kwaudi, C. (2025). Integration of geomatics to develop a DCDB for peri-urban customary land: A case study of Igam-Block Settlement, Lae. *Melanesian Journal of Geomatics and Property Studies, 10*, 29–42.

Losea, H., & Samanta, S. (2025). Watershed characterization approach to redefine bioregions: A case study at Moro and Iagifu bioregions in Southern Highlands Province, Papua New Guinea. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(2), 78–98. https://doi.org/10.63900/sygfy597

Mespuk, C., Jr., Jana, S. K., & Sekac, T. (2025). Evaluating the impact of the Fourmil standard meridian on cadastral survey accuracy in modern surveying techniques: A case study in Papua New Guinea. *Melanesian Journal of Geomatics and Property Studies, 11*, 58–78.

Mespuk, C., Jr., Jana, S. K., Sekac, T., & Pai, A. (2025). Sustainable rural development plan through UAV drone technology. *Melanesian Journal of Geomatics and Property Studies, 11*, 79–101.

Petrus, J., Babarinde, J., & Karigawa, L. (2025). An investigation into the current process and procedures of land taxation system in PNG: A case study of Lae City. *Melanesian Journal of Geomatics and Property Studies, 11*, 14–26.

Poi, N., Jana, S. K., Nerit, L., Sekac, T., & Pai, A. (2025). WebGIS integrated information management system for effective administrative functions. *International Journal of Geoinformatics, 21*(6), 105–127. https://doi.org/10.52939/ijg.v21i6.4241

Radulescu, M., Chatterjee, U., Saha, A., Roy, S. S., & Jana, S. K. (2025). Climate change and geohazards: An introduction. *Geological Journal, 60*(5), 1025–1028. https://doi.org/10.1002/gj.5208

Samanta, S. (2025). Monitoring plant health using multispectral satellite imagery based on various spectral indices. *International Journal of Geoinformatics, 21*(11), 1–13. https://doi.org/10.52939/ijg.v21i11.4593

Samanta, S. (2025). Estimation of high-resolution surface soil moisture through GIS-based frequency ratio modeling. *Nature Environment and Pollution Technology, 24*(4), 1–14. https://doi.org/10.46488/NEPT.2025.v24i04.D1775

Book Chapter

Acharyya, R., Hati, J. P., Pramanick, N., Mukherjee, S., Ganguly, S., Singh, M., Tingote, T. A., Pal, I., Jana, S. K., Pramanik, M., & Mukhopadhyay, A. (2025). Learning lessons from the scenario changes of air quality with reference to the pandemic in Delhi NCR: An MCDM approach for fighting air pollution. In *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (pp. 63–85). Auerbach Publications.

Mukhopadhyay, A., Jana, S. K., Hati, J. P., Acharyya, R., & Pal, I. (2025). Sustainable development through geospatial multi-criteria decision-making (MCDM): A comprehensive analysis. In *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (pp. 18–38). CRC Press.

Samanta, S. (2025). Monitoring agricultural health and drought conditions to support Papua New Guinea's oil palm industry using multispectral satellite images. In *AI frontiers: Transforming health, agriculture, and education* (p. 223).

Sekac, T., Jana, S. K., & Maika, N. (2025). Hydropower site optimization for sustainable energy supply: A case study in Papua New Guinea. In *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (pp. 141–153). Auerbach Publications.

Edited Books

Jana, S. K., Muduli, K., Pal, I., & Meena, P. (Eds.). (2025). *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development*. CRC Press. https://doi.org/10.1201/9781040394380

Conference Proceedings/Workshop/Seminar Presentations

Antonio, W., & Griffith-Charles, C. (2025, July 1–3). A customary land data model for a re-engineered land administration system: Promoting equity and sustainable development [Conference presentation]. *6th Pacific Island Universities Regional Network (PIURN) Conference: Harnessing Technologies for the Safe and Sustainable Development of the Pacific*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Antonio, W., & Griffith-Charles, C. (2025, August 21–22). The application of design science research methodology (DSRM) in modelling data in customary land in Papua New Guinea [Conference presentation]. *GeoPNG Congress*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Antonio, W. (2025, October 15–17). Use of spatial and surveying representation sub-package of the LADM in modelling customary land data [Conference presentation]. *57th ASPNG Survey Congress*, Lamana Hotel, Port Moresby, Papua New Guinea.

Aseri, T. G., Jana, S. K., & Kari, L. K. (2025, August 21–22). Spatial analysis of change for biodiversity assessment using remote sensing and GIS: A case study of the Managalas Conservation Area in Northern Province [Conference presentation]. *GeoPNG Congress 2025: The Inaugural Papua New Guinea National Geospatial Congress*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Karipal, R., Kari, L., & Yanabis, C. K. (2025, October 17). Geomatics integration techniques: Is it a pathway for DCDB update on a gazetted datum for Papua New Guinea? [Conference presentation]. *57th Annual Survey Congress*, Port Moresby, Papua New Guinea.

McVie, R. A., Koloa, C., & Kwaudi, C. Y. (2025, April 6–10). How can the characteristics of knowledge and innovation places in developing countries be identified? Insights from Lae City, Papua New Guinea [Conference paper]. *FIG Working Week 2025: Collaboration, Innovation and Resilience—Championing a Digital Generation*, Brisbane, Australia. https://fig.net/resources/proceedings/fig_proceedings/fig2025/papers/ts03h/TS03H_adu_mcvie_koloa_et_al_13413.pdf

McVie, R. A., Koloa, C., & Kwaudi, C. Y. (2025, August 21–22). Application of GIS tools to assess the spatial characteristics of knowledge and innovation places in Papua New Guinea [Conference presentation]. *GeoPNG Congress*, Papua New Guinea.

Motoro, P., Kang, M.-G., & Adu-McVie, R. (2024, July 3–6). Investigating urban land use changes and their effects on public schools and hospitals in Port Moresby [Conference presentation]. *Research Science and Technology Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Motoro, P. (2025, December 9–12). Urbanisation and the impact of rural–urban migration on urban decay in Port Moresby, Papua New Guinea [Conference presentation]. *State of Australian Cities Conference (SOAC)*, Brisbane, Australia.

Patra, A., & Jana, S. K. (2025, August 21–22). Futuristic potential of frequency modulated continuous wave integrated photonic LiDAR in Pacific Islands infrastructure [Conference presentation]. *GeoPNG Congress 2025: The Inaugural Papua New Guinea National Geospatial Congress*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Patra, A., & Jana, S. K. (2025, July 1–3). The history of India and its relation with Pacific Islands [Conference presentation]. *6th Pacific Islands Universities Regional Network (PIURN) Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Samanta, S. (2025, July 1–3). Spatial analysis of agricultural health and drought conditions using multispectral satellite image [Conference presentation]. *6th Pacific Island Universities Regional Network (PIURN) Conference: Harnessing Technologies for the Safe and Sustainable Development of the Pacific*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Samanta, S. (2025, October 27–30). Spatio-temporal analysis of agricultural land use patterns using multi-temporal satellite imagery [Conference presentation]. *International Technical Symposium (ITS), American Society for Photogrammetry and Remote Sensing (ASPRS)*, Virtual.

Sekac, T., Jana, S. K., & Sindang, C. K. (2025, November 24–26). Climate resilience road infrastructure management: A geospatial approach [Conference paper]. *4th International Symposium on Disaster Resilience and Sustainable Development (DRSD 2025)*, Asian Institute of Technology, Thailand.

Sekac, T., Jana, S. K., & Sindang, C. K. (2025, July 1–3). Smart and integrated techniques for climate-resilient road infrastructure planning and management in Papua New Guinea [Conference presentation]. *6th Pacific Islands Universities Regional Network (PIURN) Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Stanaway, R. (2025, August 21–22). PNG2020: A new geodetic datum for PNG workshop [Workshop]. *GeoPNG Congress*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Stanaway, R. (2025, August 21–22). The fundamental role of geodesy in the underpinning of Papua New Guinea's geospatial data framework [Conference presentation]. *GeoPNG Congress*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Stanaway, R. (2025, October 13–14). PNG2020 and GNSS CPD workshop [Workshop]. *PNGUoT/ASPNG Workshop*, Lamana Hotel, Port Moresby, Papua New Guinea.

Stanaway, R. (2025, October 15–17). A backsight and foresight perspective of the ASPNG—1960 to now and beyond [Conference presentation]. *57th ASPNG Survey Congress*, Lamana Hotel, Port Moresby, Papua New Guinea.

Stanaway, R., & Nidkombu, E. (2025, June 30–July 4). Geodesy in Papua New Guinea [Workshop presentation]. *United Nations Global Geodetic Centre of Excellence (UN-GGCE) Asia-Pacific Workshop*, ESCAP, Bangkok, Thailand.

Stanaway, R., Nidkombu, E., & Gawi, L. (2025, April 5–6). Development of PNG2020—Papua New Guinea's new geodetic datum [Workshop paper]. *FIG/ICG/IAG Reference Frame in Practice Workshop*, Brisbane, Australia.

Stanaway, R., Nidkombu, E., & Gawi, L. (2025, April 6–10). PNG2020: A new semi-kinematic geodetic datum for Papua New Guinea [Conference paper]. *FIG Working Week*, Brisbane, Australia.

Stanaway, R., Nidkombu, E., & Gawi, L. (2025, September 1–5). PNG2020: A new geodetic reference frame for Papua New Guinea [Conference presentation]. *IAG Scientific Assembly*, Rimini, Italy.

Invited Talks/Keynotes

Jana, S. K. (2025). The role of geographical information system (GIS) and remote sensing in promoting sustainable engineering solutions. *Invited talk presented at the International Conference on Sustainable Developments in Computer Engineering, Green Technology & Smart System (ICSDS-2025)*, HETC, Kolkata, West Bengal, India.

Jana, S. K. (2025). Recent advancement towards sustainability: RS & GIS for earthquake hazard assessment. *Invited talk presented at the International Seminar on Geography and Development: Recent Advancement towards Sustainability (GDRAD)*, Kandra R.K.K. Mahavidyalaya, Purba Bardhhaman, West Bengal, India.

Samanta, S. (2025, January 10). Remote sensing and GIS technology in disaster identification, monitoring, modeling, and impact assessment. *Keynote/Invited lecture presented at the International Conference on Trends & Prospects of Geospatial Technology in Research and Employment*, Mahishadal Girl's College, Purba Medinipur, West Bengal, India.

FACULTY OF ENGINEERING

SCHOOL OF CIVIL ENGINEERING

Head of the School: Dr. Mirzi Betasolo

Introduction

The School of Civil Engineering (SoCE), formerly known as the Civil Engineering Department and renamed in 2024, offers a refreshed four-year undergraduate program: the Bachelor of Civil Engineering (Honours), B.Eng. (Civil) (Hons). This fully accredited program is recognized by Engineers Australia, a signatory to the Washington Accord. The qualification is classified as Level 8 under the Papua New Guinea National Qualifications Framework, equivalent to Level 8 of the Australian Qualifications Framework. SoCE operates under the Faculty of Engineering, which is overseen by the Dean of Engineering.

Civil Engineering is the first and oldest engineering program in Papua New Guinea, established in 1966 in Port Moresby at the Papua New Guinea Institute of Higher Education. In 1968, the program was relocated to Lae, and in 1970, the institution was renamed the Papua New Guinea Institute of Technology. It attained university status in 1973 and became known as the Papua New Guinea University of Technology (PNGUoT), commonly referred to as Unitech. In 1980, the university transitioned from a faculty-based structure to a departmental system to support the introduction of four-year Bachelor programs with direct entry from Grade 12. Under this structure, the university comprised 13 departments, including four engineering departments, of which Civil Engineering was one. In 2024, PNGUoT reintroduced a faculty–School–Department hierarchical structure. This change was aimed at granting departments greater autonomy in the design and delivery of their academic programs.

SoCE also offers a two-year postgraduate program by coursework, leading to a Master in Engineering, with specializations in Structural Engineering, Environmental Engineering, Construction and Project Management, Transportation Engineering, Water Resources Engineering, and Geotechnical Engineering. Additionally, it offers a Master of Science in Solid Waste and Resource Management. For those interested in advanced research, SoCE provides on-campus programs leading to a Master of Philosophy (MPhil) and a Doctor of Philosophy (PhD).

The SoCE is equipped with modern laboratories and continues to upgrade its facilities with the latest equipment and software, supported by the Industrial Advisory Board (IAB). The school also benefits from guidance provided by its Discipline Industrial Advisory Committee (DIAC), which plays a key role in ensuring the relevance of the curriculum to current industry needs. Additionally, the Research, Development & Engagement Committee (RDEC) is responsible for enhancing the school's research output, innovation initiatives, and external engagement activities.

As of the latest reporting period, the school has 16 academic staff staff (7 on board and 4 online with PhD, 3 with Master's degrees, 2 on Master's degree). six with PhD degrees, one is currently pursuing a PhD, and have Master's degrees.

The current student enrolment includes 1 Ph.D., 1 MSc in Solid Waste & Resource Management, 4 MEngg [Civil Engineering (with course work)], 4 MPhil (Civil Engineering), and 179 undergraduate students (45 in year 1, 44 in year 2, 38 in year 3, and 52 in year 4).

Area of Specialization of the Civil Engineering Academic Staff

- **Construction & Engineering Management**
  - Dr. Mirzi Betasolo
  - Dr Alak Kumar Patra
  - Mr Murray Konzang
  - Mr Roboam Pebuar
  - Ms Stephanie Konts
  - Ms Grace Wantepe

- **Environmental Engineering**

    - Dr. Mirzi Betasolo
    - Dr. Meseret Teweldebrihan
    - Dr. Alak Kumar Patra

- **Geotechnical Engineering**
    - Dr. Talakola Laksmi Ramadasu
    - Dr. Mirzi Betasolo
    - Mr. Murray Konzang
    - Dr. Alak Kumar Patra

- **Structural Engineering**
    - Professor Abdul Mannan
    - Dr. Alak Patra
    - Dr. Mirzi Betasolo
    - Ms. Grace Wantepe

- **Transportation Engineering**
    - Prof. Sulistyo Arintono
    - Dr. Mirzi Betasolo
    - Dr. Alak Patra
    - Mr. Murray Konzang
    - Dr. Talakola Laksmi Ramadasu

- **Water Resources Engineering**
    - Prof. Ahmad Sana
    - Dr. Mirzi Betasolo
    - Ms Stephanie Konts
    - Mr Roboam Pebuar

The School of Civil Engineering's Priority Research Areas 2025

"Integrated Resilient and Sustainable Infrastructure Systems for Climate-Responsive Development"

This theme positions the (SoCE) as having strengths into a unifying, forward-looking research theme that reflects sustainability, resilience, digital innovation, and infrastructure development — particularly relevant for Papua New Guinea and similar developing regions.

- **Environmental Engineering**
    - ❖ Solid Waste Management
    - ❖ Water & Wastewater Testing and Treatment
    - ❖ Sediment Analysis to Know the Pollution Status of Rivers
    - ❖ Design of water/sewage treatment systems
    - ❖ Design of air pollution control systems
    - ❖ Anaerobic Treatment
    - ❖ Environmental Impact Assessment
    - ❖ Recycling, waste as a material resource
    - ❖ Waste to Energy
    - ❖ Not limited to the above

- **Structural Engineering**
    - ❖ Engineering properties of steel, concrete, gravel, cement, timber, coconut timber, normal & advanced composites, sustainability of structures etc.
    - ❖ Mechanics of Advanced Composite Materials. Application of artificial intelligence to materials and mechanics.
    - ❖ Earthquake impact on structures, vulnerability of structures due to ground movements, and micro zonation
    - ❖ Structural Stability
    - ❖ Bridges
    - ❖ Not limited to the above

- **Transportation Engineering**
    - ❖ Traffic Engineering and Management
    - ❖ Highway Engineering and Management
    - ❖ Public Transport Policy, Regulation, Management and Operation
    - ❖ Human Behaviour and Road Safety
    - ❖ Econometrics on road development
    - ❖ Railway
    - ❖ Tunnelling
    - ❖ Not limited to the above

- **Geotechnical Engineering**
    - ❖ Engineering properties of soil, slope stability, etc.
    - ❖ Geosynthetic material
    - ❖ Geotechnical System Isolation
    - ❖ Geosynthetic material
    - ❖ Slope and stability
    - ❖ Not limited to the above

- **Construction & Engineering Management**
    - ❖ Engineering properties of soil, slope stability, etc.
    - ❖ Construction Practices
    - ❖ Contract Policy & Administration
    - ❖ Not limited to the above

- **Water Resources Engineering**
    - ❖ Aquifer stability, drinking water sustainability
    - ❖ Impact of waves on structures
    - ❖ Coastal hydrodynamic measurements and modeling
    - ❖ Sediment transport in rivers and coasts
    - ❖ Groundwater modeling
    - ❖ Analysis and design of water supply, sanitary and storm drainage systems

Undergraduate Research Projects

Fourth-year Bachelor in Civil Engineering (Honors) students who undertake research work for partial fulfilment of the Bachelor's degree program in 2025 with their supervisors are shown in the Table below. Research Projects that were presented in the Global Virtual Conference in Civil Engineering (GVCCE) 2025 on 22nd - 23rd of

December 2025 at the School of Civil Engineering of the Papua New Guinea University of Technology are highlighted.

Title/Paper	Name of Supervisor	Name of Student/s
Water Resource Management- River System Analysis GVCCE 2025 Paper: *Hydrological Flood Modelling of Busu River, Morobe Province, PNG*	Dr. Mirzi Betasolo	Nehemiah Siune
Assessment of the Impact of Contaminant Pollution of Unitech Landfill GVCCE 2025 Paper: *GIS and Geotechnical Modelling for Containment Strategy at the Unitech Landfill*	Dr. Mirzi Betasolo	Emmanuel Avea
Assessment of GSI (Geotechnical Seismic Isolation) Technologies to Mitigate Risk in Earthquake-Vulnerable Buildings	Dr. Mirzi Betasolo	Alfred Miria Brandon James
Assessment of NRW along Zone 4 LA3.1 & Pipe Rehabilitation GVCCE 2025 Paper: *Lae Water Analysis & NRW Reduction at LA7, 2 Admin Compound Lae City PNG*	Dr. Mirzi Betasolo & Prof. Ahmad Sana	Enge Kainge
Assessment and Analysis of the Water Supply System in Lae GVCCE 2025 Paper: *Development of Geospatial Database to manage Water PNG Network and Operation Data using Open-Source Software*	Dr. Mirzi Betasolo & Prof. Ahmad Sana	Swerver Unatah
GVCCE 2025 Paper:*Technical Evaluation of Sewerage System in Lae*	Prof. Ahmad Sana	Jeremiah Hondene Rarua Kula
GVCCE 2025 Paper: *Appraisal of the Urban Stormwater Management System in Lae*	Prof. Ahmad Sana	Marapa Simon
GVCCE 2025 Paper: *Slope Stability Analysis of Kassam Pass*	Mr. Murray Konzang	Moestra Begornar Azriel Maingu Jorlando Tepu
GVCCE 2025 Paper: *Potential Kiunga to Alambak Railway Project*	Mr. Murray Konzang	Andy Nandun Jamaica Pilyo Nathaniel Nathan
Water Supply Studies and Design of a Water Supply System in Kote LLG in Finschhafen District of Morobe Province GVCCE 2025 Paper: *Water Supply Studies and Design of a Water Supply System in Daulo District Nize to Kasena*	Prof Ahmad Sana	Eddie Bowoku Martin Nilme Thomas Mackay Michael
New Bailey Bridge at Nanima Menyama District, Transnational Highway GVCCE 2025 Paper: Impact of Proposed Bailey Bridge on SDG 3 &4 in Nanima LLG, Menyamya District, Morobe Province PNG	Mr. Roboam Pebuar & Dr. Mirzi Betasolo	Kennedy Namo Levi Kaingen Libas Bakaman
Impact of Soil Structure Interaction on Tunnel Stability in Landslide-Prone Areas GVCCE 2025 Paper: *Evaluating the Impact of Soil-Structure Interaction on Tunnel Stability through Finite Element Modelling using MIDAS GTS NX*	Dr. Mirzi Betasolo	Johnathan Wantepe
Feasibility Study on Water Supply for Situm Village GVCCE 2025 Paper:*Feasibility Study on Water Supply for PNGUoT*	Ms. Stephanie Konts, Roger Yara & Dr. Mirzi Betasolo	Florian Onikre
Quality Road Pavement Design, Mount Hagen City Roads GVCCE 2025 Paper:	Dr. Mirzi Betasolo	Micah Lyolo John Sepatol

Assessment of Road Pavement Deterioration in Mt Hagen City: Focusing on Culverts and Sustainable Solutions		
GVCCE 2025 Paper: *Investigation on the Partial Replacement of Ingredients of Concrete by Modified Municipal Solid Waste Components*	Dr. Alak Kumar Patra	Kien Talvat
GVCCE 2025 Paper: *Design and Investigation of Sustainable, Firm, Durable Foundation Materials for Structural Foundation*	Dr. Alak Kumar Patra	Emmanuel Kom Nigel Niko
GVCCE 2025 Paper:*Pavement 10 km Re-design of Mutzing Zumim Markham along the Highlands Highway*	Dr. TL Ramadasu	Branden Om Brendan Benai
GVCCE 2025 Paper:*Assessment of Public Transport Operations in Honiara, Solomon Island*	Prof. Sulistyo Arintono	Alikivara Oloka
GVCCE 2025 Paper:*Sustainable Building Solution for Earthquake-Prone regions in Papua New Guinea*	Dr. Alak Kumar Patra	Sasa Pero Gordon Balone
GVCCE 2025 Paper:*Seismic Retrofitting of Bridges in Papua New Guinea*	Dr. Alak Kumar Patra	Telisha Kayabe Helpworth Toaps Shyna Paak
Development of Pavement Management System (PMS) GVCCE 2025 Paper:*Pavement Management System for Nadzab Tomodachi International Airport*	Dr. Mirzi Betasolo & Mr. Richard Raea (NAC)	Valentina Nou Scotella Ataia
GVCCE 2025 Paper:*Structural Design of Hoskins Airport to Cater for Boeing 747 Aircraft's Landing and Take-off*	Mr. Murray Konzang	Christian Nou Advent A. Lala
GVCCE 2025 Paper:*Traffic Survey and Road Traffic Management of Lae City (in 4 Zones) and the Impact of Traffic Loading from Main Wharf to Highlands Highway (New 4 Lane Freeway)*	Mr. Murray Konzang	Terry Lakakita Paul Pundi Paul Balen Jnr
Geotechnical Challenges in Structural Design and Construction GVCCE 2025 Paper:*Geotechnical Challenges in the Foundation of Structures in Earthquake Prone Areas Like PNG: A Case Study on Yalu Bridge 14-mile Lae Morobe*	Dr. TL Ramadasu	Obed Jimmy Keenoly Camillus
GVCCE 2025 Paper:*Study on Stabilization of Lae Soil with Geosynthetics in Flexible Pavement*	Dr. TL Ramadasu	McHoney Jack Jethro Waria
GVCCE 2025 Paper: *Assessment of Roads Inside PNGUoT Campus Using RoTIMS*	Prof. Arintono Dr. Mirzi Betasolo Mr. Konzang	Samson Kame
GVCCE 2025 Paper:*A Study on CBR Values by Using Geosynthetics in Flexible Pavements*	Dr. TL Ramadasu	Shemmah Tumark

Postgraduate Student Research

Name	Supervisor	Program	Research Title
Mr. Murray Konzang	Dr. Mirzi Betasolo	PhD in Civil Engg.	*Optimization of Road Infrastructure in Momase Region (as an Economic Zone) by Econometrics Modelling*
Stephanie Konts	Dr. Mirzi Betasolo	MPhil/2	*Vulnerability Assessment of Engineering Groundwater to Pollution-Taraka*
Jesmah Kepou	Dr. Alak Kumar Patra	MPhil/2	*Investigation of Alternate Materials for Better Performance of Laminated Composites*

Depa Kutao	Dr. Mirzi Betasolo	MPhil/2	*Effects of Extreme Precipitation and Flooding on Bridges and Culverts on the Highlands Highway*
Michelle Silip	Dr. Alak Kumar Patra	MPhil/2	*Comparative Study on Natural and Artificial Core Materials for Advanced Composites*
Francis Martin	Dr. Mirzi Betasolo	MPhil/1	*An Analysis of the Engineering Procurement and Contract Management in Papua New Guinea*
Anja Leso	Dr. Mirzi Betasolo	MEngg/2	*Seismic and Geotechnical Performance Assessment of a Stormwater-Harvesting Tunnel System for Flood Mitigation at PNG Unitech Campus*
Roger Yara	Dr. Mirzi Betasolo	MSc SWRM/ 2	Assessing the Impact of Village, Intact Forest, Secondary Forest and Grassland on Water Quality in the Bariji Catchment of Managalas Conservation Area Utilizing Locally Measured Soil Infiltration Rates

Research Outputs

Journal Articles

Al Balushi, N. J., Al-Mamun, A., Al Hasani, Z., Yavari, Z., Sana, A., & Dhar, B. R. (2025). Architectures of microbial electrosynthesis cell for acetate extraction: A mini review. *Bioresource Technology Reports, 30*, 102135. https://doi.org/10.1016/j.biteb.2025.102135

Mardy, A., Nikoo, M. R., Zamani, M. G., Al-Rawas, G., Nazari, R., Simunek, J., Sana, A., & Gandomi, A. H. (2025). Cluster-based downscaling of precipitation using Kolmogorov–Arnold neural networks and CMIP6 models: Insights from Oman. *Journal of Environmental Management, 380*, 124971. https://doi.org/10.1016/j.jenvman.2025.124971

Marini, L., Mannan, M. A., Kueh, A. B. H., Abdullah, A. A., Abed, F., & Gunasekaran, K. (2025). Ultra-high strength geopolymer concrete from industrial waste: Reducing anhydrous sodium silicate and steel fiber effects. *Iranian Journal of Science and Technology, Transactions of Civil Engineering*. https://doi.org/10.1007/s40996-025-02060-5

Patra, A. K., & Romo, N. (2025). Assessment of Markham Bridge concrete deck's health by Schmidt hammer test. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(2), 196–201. https://doi.org/10.63900/fm3jyh60

Rahman, S., Al Shuaili, T., Al-Mamun, A., Khudaish, E., Sana, A., Baawain, M., & Dhar, B. R. (2025). Cost-effective reduced graphene oxide/polyaniline composite coated SSM cathode for bio-electrochemical desalination: Advancing desalination via cathodic improvement. *Desalination, 597*, 118399. https://doi.org/10.1016/j.desal.2024.118399

Singh, A., & Patra, A. (2025). India vision and support for development in Papua New Guinea (PNG). *Interdisciplinary Journal of Papua New Guinea University of Technology, 1*(2), 147–159. https://doi.org/10.63900/5bhzq408

Teweldebrihan, M. D., Gnaro, M. A., & Dinka, M. O. (2025). Adsorptive removal of malachite green dye from aqueous solution using *Cordia africana* leaf as biosorbent. *Environmental Monitoring and Assessment*. https://doi.org/10.1007/s40808-025-02289-z

Teweldebrihan, M. D., & Dinka, M. O. (2025). Sustainable water management practices in agriculture: The case of East Africa. *Encyclopedia, 5*(1), Article 7. https://doi.org/10.3390/encyclopedia5010007

Teweldebrihan, M. D., & Dinka, M. O. (2025). Adsorptive removal of hexavalent chromium from aqueous solution utilizing activated carbon developed from *Spathodea campanulata*. *Sustainable Chemistry, 6*(1), Article 8. https://doi.org/10.3390/suschem6010008

Book Chapters

Patra, A. K., & Singh, A. K. (2025). Role of smart sensor in Internet of Things for structural health monitoring of composite structures. In S. Jana, S. Muduli, M. Pal, & P. Meena (Eds.), *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (p. 154). Routledge. https://doi.org/10.4324/9781032669977

Singh, A. K., & Patra, A. K. (2025). Pathways for sustainable development and multi-criteria decision-making using AI and GIS. In S. Jana, S. Muduli, M. Pal, & P. Meena (Eds.), *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (p. 1). Routledge. https://doi.org/10.4324/9781032669977

Singh, A. K., & Patra, A. K. (2025). AIoT application in smart eco-friendly manufacturing system. In S. Rath & S. Muduli (Eds.), *AIoT-driven sustainable manufacturing and operational initiatives: A smart eco-friendly manufacturing system* (Chap. 2). Taylor & Francis. https://doi.org/10.4324/9781032821559

Patra, A. K., & Singh, A. K. (2025). Recent advancements in AIoT for predicting mechanical fracture and thermal properties of glass fiber reinforced polymer composites. In S. Rath & S. Muduli (Eds.), *AIoT-driven sustainable manufacturing and operational initiatives: A smart eco-friendly manufacturing system* (Chap. 8). Taylor & Francis. https://doi.org/10.4324/9781032821559

Books

Teweldebrihan, M. D., & Dinka, M. O. (2025). *Climate finance in Africa and developing countries: Bridging the gap and building a sustainable future*. CRC Press, Taylor & Francis Group. https://doi.org/10.1201/9781003644378

Conference Papers and Presentations

Al Balushi, N. J., Al-Mamun, A., Al Hasani, Z., Yavari, Z., Sana, A., & Dhar, B. R. (2025). Architectures of microbial electrosynthesis cell for acetate extraction: A mini review [Conference paper]. *Bioresource Technology Reports, 102135*, 2025.

Betasolo, M. L., & Teweldebrihan, M. D. (2025, July 1–3). Assessing the water balance and groundwater drying trends in Papua New Guinea: The potential of soil and water conservation for recharge restoration [Conference paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Dinka, M. O., & Teweldebrihan, M. D. (2025, July 19–21). Efficiency of *Cordia africana* leaf-based activated carbon in removing hexavalent chromium (Cr (VI)) from aqueous solutions [Conference paper]. *2nd International Sociohydrology Conference*, Hongō Campus, University of Tokyo, Japan.

Muirhead, A., Amai, W., & Betasolo, M. (2025, July 1–3). Combined clean energy production [Conference paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Nikoo, M. R., Nadiri, A. A., Faal, F., Al-Wardy, M., Sana, A., & Šimůnek, J. (2025). Multi-objective optimization of coastal aquifer management based on temporal GALDIT and explainable deep learning models [Conference paper].

Patra, A. K., Singh, A. K., & Jana, S. K. (2025, August 21–22). Futuristic potential of frequency modulated continuous wave integrated photonic lidar in Pacific Islands infrastructure [Conference paper]. *GeoPNG Congress 2025*, PNG University of Technology, Lae, Papua New Guinea. https://www.pnguot.ac.pg/geopng-congress-2025

Patra, A. K., Singh, A. K., & Sil, D. (2025, July 1–3). Experimental investigation on laminated wooden composites of selected Papua New Guinean woods for sustainable structures [Conference paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Patra, A. K., & Jana, S. K. (2025, July 1–3). The history of India and its relation with Pacific Islands [Conference

paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Patra, A. K., Kepou, J., & Betasolo, M. (2025). Influence of experimental loading rate and fabrication on synthetic fiber reinforced polymeric skin of advanced composites [Conference paper]. *International Conference on Physics and Chemistry of Materials (ICPCM) 2025*, Graphic Era University, Dehradun, India.

Rahman, S., Al Shuaili, T., Al-Mamun, A., Khudaish, E., Sana, A., & Baawain, M. S. (2025). Cost-effective reduced graphene oxide/polyaniline composite coated SSM cathode for bio-electrochemical desalination: Advancing desalination via cathodic improvement [Conference paper]. *Desalination, 597*, 118399. 2025.

Sana, A. (2025). Application of sustainable risk-based analysis of a fractured aquifer impacted by crude oil spill [Conference paper]. *38th IAHR World Congress: Water: Connecting the World*, 2025.

Sana, A., & Tanaka, H. (2025). Application of low Reynolds number k-ε model to wave-current combined motion [Conference paper]. *WIT Transactions on the Built Environment, 10*, 2025.

Sana, A., & I-bri, B. (2025, July 1–3). Determination of rainfall-runoff relationship for Wadi Dayqah Catchment [Conference paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Seyed-Djawadi, M. H., Nikoo, M. R., Shahmiri, A., Siadatmousavi, S. M., Sana, A. (2025). Blind-flux, bathymetry-enhanced stacking ensemble for rapid wave-energy flux prediction along Oman's coast [Conference paper]. *Renewable Energy, 124086*, 2025.

Singh, A. K., & Patra, A. K. (2025, August 21–22). Smart geospatial platforms: Enabling data-driven solutions for sustainability and resilience [Conference paper]. *GeoPNG Congress 2025*, PNG University of Technology, Lae, Papua New Guinea. https://www.pnguot.ac.pg/geopng-congress-2025

Teweldebrihan, M. D., & Betasolo, M. L. (2025, July 1–3). A water balance assessment of the drying trend of groundwater-dependent Lake Haramaya and the potential role of soil and water conservation in its restoration [Conference paper]. *6th PIURN Conference 2025*, PNGUoT, Lae, Papua New Guinea.

Teweldebrihan, M. D., & Dinka, M. O. (2025, July 19–21). Balancing agricultural production and environmental sustainability: A socio-hydrological study of the Arjo-Dhidhessa Dam, Ethiopia [Conference paper]. *2nd International Sociohydrology Conference*, Hongō Campus, University of Tokyo, Japan.

SCHOOL OF ELECTRICAL AND COMMUNICATIONS ENGINEERING

Head of the School: Dr. Sammy Aiau

Introduction

The School of Electrical and Communications Engineering offers both undergraduate and postgraduate programs. The undergraduate curriculum includes foundational courses in mathematics and physics, along with core subjects in either power engineering or communications engineering, as well as other required electives. Students can choose to specialize in one of two areas: Communications Engineering or Power Engineering. In their final year, students undertake research projects on various topics in electrical engineering. These projects allow students to demonstrate creativity and innovation through activities such as conducting research, building prototypes, developing simulation models, and presenting their work at the end of the academic year. The projects are designed to spark engineering curiosity and encourage the development of new methodologies, emphasizing the synergy between design and innovation as a driving force for engineering ingenuity.

Furthermore, the School of Electrical and Communications Engineering offer a thriving postgraduate program, which includes a Master of Philosophy (MPhil) by research, a Master of Science (MSc) in Communications Engineering by coursework, and a Doctor of Philosophy (PhD) program. In the 2025 academic year, five candidates are enrolled in the PhD program, 14 candidates are enrolled in the MPhil program and three candidates are undertaking Masters in Engineering program (5 PhD, 14 MPhil and 3 MEngg.).

The research programs in the school are continually developing to keep pace with technological advancements. In embracing digital transformation, the Communication Engineering stream has embarked on research on networking through mobile and wireless systems, data communications, and Internet-of-Things applications in Smart Cities. The school is also excited to introduce a new stream in Computer Engineering in 2027 that will encompass micro-controller-based embedded systems design, big data analytics, robotics, and machine learning. Furthermore, as the world embarks on measures to mitigate the abyssal climate disasters, our research programs on energy, are aligned towards innovative sustainable energy of the future. The introduction of Artificial Intelligence in energy systems will revolutionize renewable energy, making it reliable, efficient, clean, and environmentally friendly. The research on sustainable energy is oriented towards microgrids in off-grid systems for remote and fragmented communities in addressing the lack of electricity in PNG where 80% of the 10 million population have no access to electricity. Further, research on Power Systems includes the reliability of PNG power grids.

Research Focus

Strategically, the school continues to pursue long-term goals of sustained excellence in research through postgraduate studies. The school academics continue to publish research articles in peer-reviewed journals and book chapters. The school has also established two research centers;

1. Centre of Excellence in Information and Computer Technology (CoEICT) and
2. Center of Innovation in Smart Grid and Renewable Energy (CoISGRE).

Staff Research Profiles

Staff	Area of specialization
Professor Paul Hoole	Artificial Intelligence in engineering systems, Sensors including antennas, Lightning engineering, electromagnetic signals in safety and security systems, and 5G/6G wireless technology for smart cities

Professor Kanthavel Radhakrishnan	Artificial Intelligence, Deep Learning, Big Data, Wireless Sensor Networks, High Performance Communication Networks, and Cloud Computing
Associate Prof. Ashish Luhach	Soft Computing, Networks, Sustainable Computing, and Cyber and Physical Systems
Dr. Joseph Fisher	Interactions of Lightning with Aircraft and Structures, Power System Analysis, High Voltage Engineering, Power Electronics and Machines, Renewable Energy, Transmission/Distribution Line Design, Energy Audit and Energy Efficiency Technologies
Dr. Ravindra Luhach	Digital Filters and VoIP, IOT, Electronics Engineering and Microwave and Radar
Dr. Sammy S. Aiau	Control Systems Engineering, Industrial Process Control, Electrical Power Systems, Renewable Energy (hydro, solar & wind), Smart Grids Energy Management, Virtual (Smart) Instrumentation Systems
Mr. Herman Kunsei	Adaptive Array Antenna Systems for 5G and 6G Networks, Electromagnetic Health Hazards, Propagation Measurements for Wireless Systems, Computer Network Security, Reliability in Networks, and Data Security
Mr. Gibson Kupale	Technical & non-technical losses in Power Systems, Power System Protections, Renewable energy systems, and Distributed Renewable Energy Generation. System Reliability & Security, and Field Excitation & Governor Control
Mr. David Chen	Big Data Processing, Compiler Design, Internet of Things, Wireless Networking and Signal Processing, Hardware Design, Data and Network Security, Business Process Modelling, Knowledge Management, and e-learning.
Mr. James Dugumari	Data Communications and Networks, Computer Architecture & Interfacing, and Computer Communication, Database, eCommerce and Inventory tracking applications
Mr. Joshua Yuanko	Optimization and Auto Scheduling Algorithms, Power Flow Control and Automatic Topology Reconfiguration, Power Systems Static and Dynamic Reliability, Grid Connected PV Plant Design and Modelling, Instrumentation and Microcontroller electronics

Undergraduate Student Projects

During the 2025 academic year, students completed a number of independent research projects under the final-year undergraduate research courses EN411 – Research Project A (Semester 1, 2025) and EN412 – Research Project B (Semester 2, 2025). These projects comprised a two-semester sequence in which students completed data gathering, analysis, and thesis preparation in EN412 after initially developing their research proposals, literature evaluations, and methodological frameworks in EN411.

Student name	Program	Project Title	Supervisor/s
Gavozo Hasu	BEEC4	*Development of Real-Time Remote Patient Monitoring System based WSNs*	Dr. Hikma Shabani
Junior Sombo Kamaso	BEEC4	*Online Sensor Fault Detection based on an Improved Strong Tracking Filter*	Dr. Hikma Shabani
Jeremiah Kila	BEEC4	*Solar Wireless Electric Vehicle Charging System*	Dr. Hikma Shabani
Michelle Miname	BEEP4	*Kalman Filter Based Sensor Fault Detection in Wireless Sensor Network for Smart Irrigation*	Dr. Hikma Shabani

Michael Kevau	BEEC4	*Mobility Management for Video Streaming on Heterogeneous Networks*	Dr. Dhaya Kanthavel
Kialou Poli	BEEC4	*Wormhole Attack Detection Algorithm Using Near Field Communication*	Dr. Dhaya Kanthavel
Cedrick Gregory	BEEP4	*Energy Generator from Fluid Turbulence of Non-Compressible Fluid*	Mr. David Chen
George Alumahi	BEEP4	*Compliant Mechanism Based Fluid Propulsion Prototype*	Mr. David Chen
Junineh Nani	BEEC4	*Pen Based Whiteboard Large Format Portable Plotter*	Mr. David Chen
Dekay Senis	BEEP4	*Energy Generator from Fluid Turbulence of Compressible Fluid*	Mr. David Chen
Ali Wau	BEEP4	*Impact of Renewable Energy Integration on Load Flow*	Mr. Gibson Kupale
Nathaniel Kayamba	BEEP4	*Comparative Analysis of Load Flow Methods*	Mr. Gibson Kupale
Emmanuel Willie	BEEP4	*Effects of Distributed Generation (DG) on Load Flow*	Mr. Gibson Kupale
Jetro Nisa	BEEP4	*Impact of Renewable Energy Integration on Grid Stability in PNG*	Mr. Gibson Kupale
Osinia Mosa	BEEP4	*Development of an Automatic Load Shedding System for Small Power Grids*	Mr. Gibson Kupale
Micha Lalip	BEEP4	*Power Quality Assessment in an Urban PNG Substation*	Mr. Gibson Kupale
Clayton Nixon	BEEP4	*Design and Implementation of a Battery Management System for EV*	Professor Raj Kumar
Emmanual Philip	BEEC4	*Traffic Control for Smart Cities*	Professor Raj Kumar
Alex Kilo	BEEP4	*Localization of Acoustic Signals Using Signal Wavefront Analysis Via Machine Learning Techniques.*	Professor Kandasamy Pirapaharan
Marbo William	BEEC4	*AI AI-based beam-steering Antenna Configuration for Maximum Power Transfer*	Professor Kandasamy Pirapaharan
Kaiyo Noki	BEEP4	*Optimal Placement of 3 Phase Filter for Reliable Harmonics Compensation in Grid Tied PV Plant Electrical Substation*	Mr. Joshua Yuanko
Menzin Womin	BEEP4	*MATLAB Model of 3 Phase Active Filter for Harmonics Compensation in 132kV/32kV MV Electrical Substation*	Mr. Joshua Yuanko
Jayson Paraka	BEEP4	*Fault Detection in Power Lines Using IoT*	MrMathew Pua
Nehemiah Gabriel	BEEP4	*Smart Home Energy Management System*	MrMathew Pua
Yosi Midion	BEEP4	*Automatic Transfer Switch Using Programmable Logic Controller*	Mr. Mathew Pua
Naylor Kapin	BEEP4	*Analysis of the electric loads of residential and public buildings in urban power supply systems*	Mr. Mathew Pua
Tuvey Mela	BEEP4	*Smart Farming System Using Sensors For Agricultural Task Automation*	Mr. Mathew Pua
Francis Kuapa	BEEP4	*Genset synchronization to meet load demand*	Mr. Mathew Pua

Clinton Ogil	BEEP4	*Cost and Effectiveness of Solar and Wind Power Installations in Papua New Guinea: three case studies*	Professor Paul Hoole
Ham Dowa	BEEP4	*Improving the Reliability of the Three Power Grids in Papua New Guinea: A Computer Based Analysis and Redesign*	Professor Paul Hoole
Lawrence Modudula	BEEP4	*Laser based Lightning Protection: The Transient Electric Currents*	Professor Paul Hoole
Deshaun Stephana	BEEP4	*Study and Characterization of Lightning Swept Stroke on Metallic and Carbon Fiber Aircraft*	Professor Paul Hoole
Nema Arred	BEEP4	*Design of Cost-Effective Real-time Power System Monitoring of Standalone Community Wi-Fi Setups for Sustainability*	Mr. Herman Kunsei
Melissa Paul	BEEC4	*Design of Cost-Effective Real-time Communications System Monitoring of Standalone Community Wi-Fi Setups for Sustainability*	Mr. Herman Kunsei
Zono Tonefa	BEEP4	*Piezoelectric Energy Harvester Driven by Falling Water for Off-grid Communities*	Dr. Joseph Fisher
Hillary Rahiria	BEEP4	*Evaluation of Lightning Protection of the 132 kV Aerial Transmission Line of Ramu Grid*	Dr. Joseph Fisher
Jerex B Nale	BEEP4	*Lightning Protection Studies of Solar Farm Installations*	Dr. Joseph Fisher
Bomai Pasi	BEEP4	*Laboratory Training for Hybrid Microgrid Systems*	Dr. Joseph Fisher
Manu Sale	BEEP4	*Smart Microgrid Solutions for Transforming Remote Communities in PNG*	Dr. Joseph Fisher
Imma Makui	BEEC4	*GPS-Tracking and Recovery of Stolen Solar Panel and Battery from Remote Mobile Base Stations: Case Study – Vodafone PNG*	Dr. Sammy Aiau
Ezekiel Timothy	BEEP4	*Optimization of Microgrid Power System: Case Study Manbisanda Rural Health Centre, Wapenamanda District, Enga Province*	Dr. Sammy Aiau
Adrian Efi	BEEP4	*Modelling of Renewable Sources and Distributed Energy Resources Using ETAP Energy Management System.*	Dr. Sammy Aiau
Cendrick Parapan	BEEP4	*Develop an Interactive Solar and Wind Database System for Papua New Guinea*	Dr. Sammy Aiau
Julius Petrus	BEEP4	*Design and Planning of Wind Farm for Sialum Local Level Government, Tewai-Siassi District with Use of Software*	Dr. Sammy Aiau
Immanuel Sisaho	BEEC4	*GPS-Tracking of Small Sea Crafts Lost in the Seas in the Maritime Provinces of Papua New Guinea*	Dr. Sammy Aiau
Meshach Waninga	BEEP4	*Development of a Self-Powered Transformer Data Logger for Real-Time Monitoring*	Mr. Wilson Kepa
Joy Iwais	BEEP4	*Microcontroller Based Automatic Generator Start/Stop and Load Transfer via Automatic Transfer Switch*	Mr Wilson Kepa
Maya Pale	BEEP4	*Solar Powered Automatic Irrigation System: A case study for Rice Farming in Markham Valley*	Mr. Wilson Kepa

Stanley Yapao	BEEP4	*Microcontroller Based Automatic Generator-grid Synchronization and Predictive Load Prioritization*	Mr. Wilson Kepa
Doko Tai	BEEP4	*Tower Earthing Resistance Testing & Measurement for Digicel Communications Towers*	Mr. Micah Yanage
Abraham Idau	BEEP4	*Optimizing the Lightning Protection System for Digicel Communications Towers*	Mr. Micah Yanage

Postgraduate Research Projects

Electrical Power Systems, Renewable Electric Energy Sources, Advanced Wireless Technology, and Telecommunication Networks are the main fields of study conducted at the postgraduate level. These fields, which cover both basic and practical facets of contemporary electrical and communication engineering, represent the main emphasis of postgraduate study and instruction. In order to fulfill the changing demands of technology and society, research in these areas seeks to assist the development of effective power systems, sustainable energy solutions, cutting-edge communication technologies, and reliable telecommunication networks.

Name	Program	Project Title	Supervisor/s
Herman Kunsei	PhD/3	*Using Perception ANN with Different Triggering Functions for Linear and Non-linear Array Arrangements*	Professor Paul Hoole
Jacqueline Kalate Tantapua	PhD/2	*Interference Mitigation and Power Optimization in D2D Environments within 5G Networks*	Professor Raj Kumar
Mathew Pua	PhD/2	*Power Quality Analysis of Grid-Connected Photovoltaic Systems in Distribution Networks using Machine Learning*	Associate Professor Dr. Ashish Kumar Luhach
Terry Ricky	PhD/1	*Analysis of potential cybersecurity threats in the Centralized Grid System: A Case Study in PNG*	Associate Professor Dr. Ashish Kumar Luhach
Gau Taumaku	PhD/1	*Logically-Defined Federated Learning Framework for Privacy-Preserving Anomaly Detection in Simulated Smart Grid Networks*	Associate Professor Dr. Ashish Kumar Luhach
Ernest Pokau	MPhil/2	*Design and Development of a Low- Cost Cellular Connected Quad plane for Maritime Applications in Manus Province, Papua New Guinea*	Associate Professor Dr. Ashish Kumar Luhach
Barney Kai Boma	MPhil/2	*Investigating the Impact of Genset Utilization on Industrial Operations: A Case Study of Goodman Fielders's 11 Mile Power Plant in Papua New Guinea*	Dr Sammy Aiau
Antonio Olive	MPhil/2	*Exploring the Potential for the Use of Biomedical Sensors and Electronic Health Records in Triaging in the Emergency Department in Papua New Guinea*	Professor Paul Hoole/Mr. Kunsei Herman

Kenson Rocky Tonny	MPhil/2	*Microcontrollers-Based Data Acquisition (DAQ), and Smart Monitoring for Hybrid Renewable Energy Systems in Rural Papua New Guinea*	Professor Paul Hoole/Dr. Joseph Fisher
Rani Maeoaka	MPhil/2	*Security Analysis and Reliability Evaluation of Transmission Line Network Performance Comparing Ring Configuration with the Planned Radial Network for the Forecasted High Growth Scenario for Ramu*	Dr Joseph Fisher
Ken Wambi	MPhil/2	*Using Wireless Sensor Networks in Farms for Data Collection, Storage and Analysis to Enhance Agricultural Practices in Papua New Guinea*	Dr. Hikma Shabani
Ray Riripi	MPhil/2	*Introducing Electromagnetic Field Strength threshold Limits as a GSM and related Network Performance Assessment Parameter*	Professor Kadasamy Pirapaharan
Pascal Junior Bune	MPhil/1	*Enhancing Legal Frameworks and Institutional Capacities for Cybersecurity: An Analysis of Papua New Guinea's Electronic Transactions Act and Cybercrime Code Act*	Mr. David Chen
Philemon Kama	MPhil/1	*Optimization of Distributed Renewable Energy Hybrid Power System. A Case Study of Integrating Micro-hydro and Solar Power*	Dr. Sammy Aiau
Jacob Wai	MPhil/1	*Integrating Run-of River Hydropower with Hybrid Solar Power System and its Stability Analysis.*	Dr. Sammy Aiau
Samson Saka	MPhil/1	*Smart Power Grid with Self-healing Network with the use of Artificial Intelligence (AI)*	Dr. Sammy Aiau
Frank Lopson	MPhil/1	*Design and Development of a Magnetic Field-Based Detection and Localization system for High Voltage Transmission Lins In Papua New Guinea using GPS and Scada Integration*	Associate Professor Dr. Ashish Kumar Luhach
Elias Mandawali	MPhil/1	*Artificial Intelligence Implementation in Papua New Guinea Telecommunications*	Professor Raj Kumar
Yangobing Yana	MPhil/1	*Toward a Scalable IoT-Based Solution for Monitoring and Control of Micro Hydro Power Systems: Supporting Decentralized Energy Policy in Papua New Guinea*	Dr. Sammy Aiau
Amos Kakarya	MECE/2	*Design of Monitoring Nodes and 5G Exposure Measurements*	Professor Raj Kumar
William Kunjip	MECE/2	*Optimizing Content Distribution Network for Developing Infrastructures: A Case Study CDN Implementation in Papua New Guinea*	Associate Professor Dr. Ashish Kumar Luhach
Vincent Mombea	MECE/1	*Unreported*	Associate Professor Dr. Ashish Kumar Luhach

Funded Staff Research and Development Projects

Project Title and Number:	*Design of Monitoring Nodes and 5G exposure Measurements*
Funding Source :	Papua New Guinea University of Technology
Project Duration:	One year
Funding Amount:	K10, 400
Project Team:	Prof. Raj Kumar Mr. Amos Kakarya
Outputs, Outcomes and Key impacts:	Outputs, Outcomes: - Master thesis has been submitted by Mr. Amos Kakarya Key impacts: The PNG is in the process of deploying the 5G network technology in the country. The project study will help in following - It provides evidence-based observations to inform Papua New Guinea telecommunications and public health policy in 5G deployment. - Its outcome can act as a model for other Pacific Island nations and developing countries with similar challenges of adopting 5G. - It synthesizes current science evidence and identifies pertinent research gaps to inform Papua New Guinea - It explores specific needs and potential opportunities for Papua New Guinea to further enhance its capacity for regulation and monitoring 5G EMF exposure.

Project Title and Number:	*Strengthen Teaching and Learning Through Research and Innovation: Upskilling People and Process*
Funding Source:	External, Higher Education Partnership Grants 2025, Australia Awards PNG
Project Duration:	June 2025 – June 2026
Funding Amount:	AUD50, 000
Project Team:	PNGUoT Lead – Herman Kunsei University of Queensland Lead – Professor Amin Abbosh
Outputs, Outcomes and Key impacts:	Key Outcomes: - Strengthen of research leadership for the capstone projects in Faculty of Engg (FoE) - Refining of processes to encourage innovative research projects at the final year - Development of research methods course for the FoE

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher
Prof. Kandasamy Pirapaharan	Reviewer	Telecom Mathematics Information Technology Symmetry	MDPI, Switzerland
Prof. Kanthavel	Editorial Board Member	International Journal of Recent Trends in Technology and Engineering	Blue Eyes Intelligence Engineering and Sciences Publication
Prof. Kanthavel	Review Committee	Nature	Springer

	Member		
Prof. Kanthavel	Review Committee Member	International Journal of Telecommunication	Wiley
Prof. Kanthavel	Review Committee Member	Sensors	MDPI, Switzerland
Prof. Kanthavel	Review Committee Member	Computers and Electrical Engineering	Elsevier, The Netherlands

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
Dr Sammy Aiau	Annual Membership	IEEE	Piscataway, NJ, USA	2025
	2 Year Membership	National Institute of Standards and Industrial Technology (NISIT)	PNG	2025-2026
Prof. Radhakrishnan Kanthavel	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Prof. Raj Kumar	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Prof. Kandasamy Pirapaharan	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Dr. Ashish Luach	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Dr. Hikma Sabani	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Dr Joseph Fisher	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Mr. Gibson Kupale	Annual Membership	IEEE	Piscataway, NJ, USA	2025
Mr. Herman Kunsei	Annual Membership	IEEE	Piscataway, NJ, USA	2025

Research Outputs

Journal Articles

Adaline Freeda, D., & Kanthavel, R. (2025). AAI and XAI for resource allocation in ZSM network. *KRONIKA Journal, 25*(5), 304–313.

Das, R. P., Muduli, D., & Luhach, A. K. (2025). Exploring algorithmic solutions and network modelling to address optimisation challenges in IoT environments. *International Journal of Engineering Systems Modelling and Simulation*, *16*(5), 315–333. https://doi.org/10.1504/IJESMS.2025.148266

Kanthavel, R., & Dhaya, R. (2025). Advancements in sepsis detection: A review of supervised and unsupervised machine learning methods versus traditional approaches. *Innovation and Emerging Technologies, 12*, 2550029.

Kanthavel, R., & Dhaya, R. (2025). AI-driven HFL with adaptive task offloading for privacy-preserving and energy-efficient edge IoT networks. *IEEE Internet of Things Magazine.*

https://doi.org/10.1109/MIOT.2025.3606492
Kanthavel, R., & Dhaya, R. (2025). Breaking the loop: Adversarial attacks on cognitive-AI feedback via neural signal manipulation. *EAI Endorsed Transactions on Security and Safety, 9*(1). https://doi.org/10.4108/eetss.v9i1.9502
Kanthavel, R., & Dhaya, R. (2025). Federated learning (FL)-driven real-time decision support for intraoperative cardiovascular surgery: A privacy-preserving AI framework. *Innovation and Emerging Technologies, 12*, 2550025.
Kanthavel, R., & Dhaya, R. (2025). A hybrid forecasting approach for solar power generation in smart grids using long short-term memory and autoregressive integrated moving average. *Turkish Journal of Electrical Power Energy Systems*. https://doi.org/10.5152/tepes.2025.25021
Kanthavel, R., Dhaya, R., & Adline Freeda, R. (2025). Artificial intelligence (AI) and big data in pharmacovigilance: A transformative approach. *Journal of Engineering and Technology Management, 76*, 1679–1695.
Kanthavel, R., Dhaya, R., & Adline Freeda, R. (2025). Fusion of deep learning with traditional image processing technique. *Journal of Informetrics, 19*(2), 384–409.
Kanthavel, R., Dhaya, R., & Freeda, R. A. (2025). Federated learning for artificial intelligence in embedded systems. *ICCK Transactions on Emerging Topics in Artificial Intelligence, 2*(2), 91–115.
Kanthavel, R., & Dhaya Adaline Freeda, R. (2025). Blockchain-based framework for secure and privacy-preserving peer-to-peer communication in dApps. *Journal of Engineering and Technology Management, 76*, 1387–1410.
Kanthavel, R., Dhaya, R., Khalaf, O. I., & Hamad, A. A. (2025). Artificial intelligence-based smart cloud computing schema model. *Journal of Control and Cybernetics, 53*(4), 639–672. https://doi.org/10.2478/candc-2024-0025
Kepa, W., Mazaeda, R., Echevarría, R., & Kumar, R. (2025). Event-based PI control applied to laboratory plant. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(2), 120–133.
Taumaku, G., & Luhach, A. K. (2025). *Anomaly detection in smart grids using machine learning: A real-time streaming approach using Apache Kafka and Kubernetes. Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(2) https://doi.org/10.63900/j960ab54
Terry, R., & Luhach, A. K. (2025). *Analysis of cyber security challenges in smart grids*. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2). https://doi.org/10.63900/qawbms22
Tirones, S., & Kumar, R. (2025). Automatic 12-volt battery charge controller for telecommunication systems. *International Journal of Inventive Engineering and Sciences, 12*(5), 25–31.

Conference Papers

Adline Freeda, F. R., Kanthavel, R., & Dhaya, R. (2025). Advanced biosensing technologies with artificial intelligence integration. In *Proceedings of the 11th International Conference on Sensors and Electronic Instrumentation Advances (SEIA 2025)*, Ponta Delgada, São Miguel (Azores Islands), Portugal, September 24–26, 2025.
Kanthavel, R., Adline Freeda, F. R., & Dhaya, R. (2025). Advanced sentiment analysis using hybrid-ensemble deep learning techniques. In *Proceedings of the 2025 IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI)* (pp. 1–5). Gwalior, India.
Kanthavel, R., Adline Freeda, F. R., Dhaya, R., Sudha, K., Suja, J., & Julianne, S. (2025). Privacy preserving techniques for IoT-based energy management systems. In *Proceedings of the 4th International Conference on Innovative Mechanisms for Industry Applications*. Vijayamangalam, India.
Kanthavel, R., Adline Freeda, R., Dhaya, R., S. J. S., & S. K. V. V. (2025). A study on recognizing and analyzing aerobics movements by AI-based video feature extraction. In *Proceedings of the 2025 IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI)*. Gwalior, India.

Luhach, A. K., Jat, D. S., Ghosh, U., Gao, X.-Z., & Lingras, P. (Eds.). (2025). *Advanced informatics for computing research: 6th International Conference, ICAICR 2023, Rohtak, Haryana, India, December 16–17, 2023, revised selected papers, part II*. Springer.

Oral/Poster Presentation

Kunsei, H., Pirapaharan, K., & Hoole, P. (2025, February 10–11). Applying artificial neural network on antenna radiation pattern in tracking mobile users for smart city application. Paper presented at the *6th Australian Microwave Symposium*, Griffith University, Gold Coast, Queensland, Australia.

Books/ Edited Volumes

Vasanthi, R., Palaniappan, R., & Radhakrishnan, K. (Eds.). (2025). *Web intelligence and human–machine interaction: Proceedings of ICWIHI 2025* (AISC Series, Vol. 3). Springer. https://link.springer.com/book/9789819685622

Book Chapters

Adline Freeda, R., Kanthavel, R., & Dhaya, R. (2024). The convergence of cybersecurity and cloud computing. In *Convergence of cybersecurity and cloud computing* (pp. 53–74). IGI Global. https://doi.org/10.4018/979-8-3693-6859-6.ch004

Anju, A., Kanthavel, R., & Venket, K. (2025). Personalized treatment and patient care using AI. In R. Kanthavel & R. Dhaya (Eds.), *AI for large scale communication networks*. IGI Global. https://doi.org/10.4018/979-8-3693-6552-6.ch013

Dhaya, R., Adline Freeda, R., & Kanthavel, R. (2025). Gaming and virtual environments: Changing technological developments. In *Revolution with generative AI: Trends and techniques* (pp. 87–104). Springer Nature Switzerland.

Dhaya, R., Kanthavel, R. (2025). An extensive analysis of artificial intelligence-based network management in software-defined networking (SDN). In R. Kanthavel & R. Dhaya (Eds.), *AI for large scale communication networks*. IGI Global. https://doi.org/10.4018/979-8-3693-6552-6.ch005

Dhaya, R., Kanthavel, R., Freeda, A., Anju, A., & Vijay, F. (2025). Blockchain and Internet of Medical Things (IoMT). In S. Jain, K. Kaushik, & A. Kumar (Eds.), *Blockchain-assisted technologies for sustainable healthcare system*. Springer, Singapore.

Freeda, A. R., Anju, A., Kanthavel, R., Dhaya, R., & Vijay, F. (2024). Integrating AI-driven technologies into service marketing. In *Integrating AI-driven technologies into service marketing* (pp. 375–394). IGI Global.

Freeda, A. R., Anju, A., Venket, K., Dhaya, R., & Kanthavel, R. (2024). Role of ChatGPT in smart cities. In *Applications, challenges, and the future of ChatGPT* (pp. 189–201). IGI Global.

Freeda, A., Kanthavel, R., & Anju, A. (2024). Scalability issues in AI computing in large-scale networks. In R. Kanthavel & R. Dhaya (Eds.), *AI for large scale communication networks*. IGI Global. https://doi.org/10.4018/979-8-3693-6552-6.ch018

Kanthavel, R., Adline Freeda, R., Venket, S. K., Anju, A., Dhaya, R., Vijay, F., & Fisher, J. (2025). Analysis of AI for optimization of smart grids. In *AI and blockchain in smart grids*.

Kanthavel, R., Anju, A., Adline Freeda, R., Venket, S. K., Dhaya, R., Vijay, F., & Fisher, J. (2025). An analysis of security threats in quantum computing information processing. In *Quantum computing*. Taylor & Francis.

Kanthavel, R., Dhaya, R., & Freeda, R. A. (2025). AI and ML-based decision models and their effective utilization across interdisciplinary applications. In *Geometrical enhancements based on data-driven design decisions* (pp. 68–81). CRC Press.

Kanthavel, R., Dhaya, R. (2025). Research review on AI-powered 6G as sixth-sense technologies. In R. Kanthavel & R. Dhaya (Eds.), *AI for large-scale communication networks*. IGI Global. https://doi.org/10.4018/979-8-3693-6552-6.ch017

Kanthavel, R., Freeda, R. A., & Dhaya, R. (2025). Reinforcement learning in generative AI: State-of-the-art performance. In *Revolution with generative AI: Trends and techniques* (pp. 65–86). Springer Nature Switzerland.

Kanthavel, R., Venket, S. K., Anju, A., Adline Freeda, R., Dhaya, R., Vijay, F., & Fisher, J. (2025). Blockchain and digital twin applications in precision agriculture: A comprehensive approach. In *Blockchain and digital twin applications in smart agriculture* (pp. 308–315). Auerbach Publications.

Srilakshmi, R., Choudhary, S., Raja, R., & Luhach, A. K. (2025). Syndrome detection unleashed: Computer vision applications in neurogenetic diagnoses. In *Genomics at the nexus of AI, computer vision, and machine learning* (pp. 25–58).

Shabani, H. (2025). Finite difference time domain method to investigate electromagnetic field variation in large-scale networks. In R. Kanthavel & R. Dhaya (Eds.), *AI for large scale communication networks*. IGI Global.

Invited Keynote and Speaker Engagements

Kanthavel, P. (2025, August 12–13). *Keynote address at the 9th International Conference on Inventive Systems and Control (ICISC 2025)*. JCT College of Engineering and Technology, Coimbatore, Tamil Nadu, India.

Kanthavel, P. (2025, July 23–25). *Keynote address at the 8th International Conference on Computing Methodologies and Communication (ICCMC 2025)*. Surya Engineering College, Erode, India.

Kanthavel, P. (2025, October 8–10). *Keynote address at the 9th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (ISMAC 2025)*. Tribhuvan University, Nepal.

Pirapaharan, K. (2025). *Invited speaker at the AI Summit 2025*. International Training Institute, Papua New Guinea.

SCHOOL OF MECHANICAL ENGINEERING

Head of the School: Dr. Kamalakanta Muduli

Introduction

The School of Mechanical Engineering considers engineering research to be very important as it leads to an expansion of knowledge and discoveries of new products and services. It is research that leads to breakthroughs in engineering and technology. Research and experimental development comprise creative work undertaken systematically to increase the stock of knowledge, including knowledge of man, culture, and society, and the use of this knowledge to devise new applications.

Engineering research is the systematic investigation and study of materials and sources to establish facts and reach new conclusions, so it shapes people's understanding of the world around them. Research involves testing hypotheses and predictions using testable data and a full package of scientific and engineering tools and methods.

Research Focus

The school has a focus on the following areas of research in mechanical engineering:

i. Design and Manufacturing
ii. Computer-Aided Design and Engineering Modeling
iii. Energy and Environment
iv. Control Engineering and Mechatronics
v. Materials Characterization
vi. Engineering Education and Management
vii. Computational Fluid Dynamics (Single-phase & Multi-phase Flows, Turbulence Modelling)

The school encourages faculty to conduct their research by concentrating and focusing on the above areas.

Staff Profiles

Name	Research Expertise and Interests
Dr. Kamala K. Muduli	Operations Management, Decision sciences, Machining, Sustainable Development, Health Care, Waste Management, and Ergonomics
Dr. Aezeden Mohamed	Corrosion Engineering, Machine Design, Non-Destructive Technologies, Biomedical Engineering, Failure Analysis, Materials and Manufacturing processing. Engineering Education
Dr. Shoeb Ahmed Syed	Numerical Modeling, Computational Fluid Dynamics and Heat Transfer, Combustion, Fluid-Structure Interaction, Turbulence, 2 or 4 Stroke Reciprocating Engines, Renewable Energy
Dr. Jack Khallahle	Computational Fluid Dynamics, Thermodynamics, Thermal Power Systems, Heat Transfer, Engineering Economics, Engineering Noise Control and Machine Design
Dr. Steve Ales Korokan	Materials Science & Engineering: Friction Stir Welding (FSW) Al-Al and Al-high Temperature Alloys; Smart Materials and other Alloys, Design, and Manufacturing; Production of Fiber-reinforced Polymer Composites, Renewable Energy-Geothermal, Bio, Wind, and Solar - and Energy Policy
Dr. Bikash Ranjan Moharana	Welding, Mechanical and metallurgical analysis, Process Optimization, Advanced Machining Processes, and Sustainable Manufacturing Technology

Dr. Khazar Hayat	Mechanical Design, Composite Materials & Structures, Multiscale Analysis, Structural Health Monitoring (SHM), Renewable Energy Technologies
Mr. Brian N'Drelan	Renewable energy–Solar, Tidal, and Wind. Failure of Components and Systems in Alluvial Mining Engineering, Experimental Engineering, and Operations Management

Major Professional Recognitions, Accomplishments and Awards

Name of the staff	Designation	Award/ recognition	Awarding body	Level (National/Regional/ International)
Dr. Kamalakanta Muduli	Associate Professor and Head of School	Bipin Behari Mohanty Memorial Award	Institution of Engineers, India	National
Dr. Shoeb Ahmed Syed	Senior Lecturer and Dean of Faculty of Engineering	Certificate of appreciation for valuable contribution as a Scientific committee member, 2nd Edition of Africa International Conference on Clean Energy and Energy Storage (**AICCEES 2024)**	AICCEES 2024 Organizing Committee **(**2024-2025) (Received the certificate in January 2025)	International

Undergraduate Student Projects (BEME)

Student Name	Project Title	Supervisor
Daniel Kale, Jimmy Ovia	*Portable Sago Shredding and Processing Machine*	Dr Aezeden Mohamed
Pandan Ipara, Paul Alom	*Development of a Universal Hydraulic Tire Press*	Dr Aezeden Mohamed
Denly Guli, Julius Wong	*Micro Hybrid Hydro-Solar Power System*	Dr Aezeden Mohamed
Samuel Talpa, Solomon Peter	*AI-Driven Predictive Maintenance for Rotating Machinery*	Dr Aezeden Mohamed
Adam Banka	*Optimal Design and Installation of Solar-Powered Water Supply System for Malasiga Village*	Dr Aezeden Mohamed
Janelene Kainge, Kuya Rofiyake	*Pre-Feasibility Study of a Micro-Hydro Power Scheme for Gotomi Station*	Dr Jack Khallahle
Pelis Judie	*Numerical Study on the Effect of Liquid Viscosity on Gas Wall Shear and Interfacial Shear Stress in a Horizontal Pipe*	Dr Jack Khallahle
Savictoria Talita, Shorntelle Taiye	*Feasibility Study of Borefield Solar Powered Water Supply and Irrigation System for Ialibu Station*	Dr Jack Khallahle
Immanuel Tapela, Meshack Ekip	*Numerical Validation of Flow Patterns of Two-Phase Oil/Water Flow in Horizontal Pipe*	Dr Jack Khallahle

Shellastine Kuk	*Feasibility Study for a Cool Room Design to Store Agricultural Produce for Tambul Nebilyer District*	Dr Jack Khallahle
Balu Andia, Fabian Pasul	*AI Preventive Maintenance for Rotating Machine*	Dr Khazar Hayat
Machanzsen Gelua, Dean Poko	*Implementation of Condition-Based Monitoring Maintenance in Ramu Nico Mine*	Dr Khazar Hayat
Camembert Pakao, Oscar Pryke	*Development of a Small-Scale Composite Vertical-Axis Wind Turbine (VAWT)*	Dr Khazar Hayat
Belsahzzar Yimbang, Kama Julloscra	*Design and Development of a Hydraulic Ram Pump for Rural Communities*	Dr Steve Ales Korokan
David Mokepwesi	*Design and Fabrication of Simple Garden Weeder Tool/Machine*	Dr Steve Ales Korokan
Jadelle Purtang	*Optimization of Corrosion Preventive Maintenance in Oil & Gas Industry*	Dr Bikash Moharana
Moses Nathan, Turliu Allan	*Development of Small-Scale Hydro System Focusing on Overall System Design, Turbine Efficiency and Work Output*	Dr Bikash Moharana
Brendan Wakeri, Brenth Karol	*Waste to Energy: A feasibility for urban waste management in Port Moresby*	Dr Shoeb Ahmed Syed
Elkiu Kobila, Fletcher Bob	*Design and Optimization of Direct Electrical Heating System for Subsea Oil and Gas Pipelines*	Dr Shoeb Ahmed Syed
Peter Undaba, Powaseu Jnr Malikes	*Geothermal Potential Assessment for Renewable Energy in PNG*	Dr Shoeb Ahmed Syed
Benjamin Pep, Elliuda Kaski	*Upgrading of Timin Mini Hydro to Meet Higher Demand*	Dr Shoeb Ahmed Syed
Aurora Takendu	*Development of an AI and Big Data-Driven Quality Improvement Model for Food Processing and Beverage Industries*	Dr Kamalakanta Muduli
Nigel Palau, Stonny Daniel	*Design and Implementation of Mini Hydro at Vanimo*	Mr Brian N'Drelan
Joshua Michaels, Masili Malasta	*Hydraulic Arm for Lifting Rubbish Bins*	Mr Brian N'Drelan
Benjamin Kuriana, Gubung Anong	*Optimization of Haul Truck Fuel Consumption for Ramu Nico Mining*	Mr Brian N'Drelan

Postgraduate Student Projects

Student Name	Program	Research Projects	Supervisors	Status
Brian N'Drelan	PhD	*Failure of Components and Systems in Alluvial Mining Engineering*	Dr. Kamalakanta Muduli	Thesis Submitted for Evaluation
Granville Embia	PhD	*Digital Technology Enabled Maintenance Practices for Enhanced Sustainable Organizational Performance: Myth or Reality?*	Dr. Kamalakanta Muduli and Dr Shoeb Ahmed Syed	In-progress
Sachhi Nero	MEngg	*Implementing IoT and Automation for Quality Control in Beverage Industries: A Comprehensive*	Dr. Kamalakanta Muduli	Thesis Submitted for Evaluation

		Approach to Fill Level Inspections and Early Alert System		
Max Aiso	MEngg	*Assessment of Weld Integrity on Mild Steel*	Dr. Steve Ales	Thesis Submitted for Evaluation
Josek Johnson	MEngg	*Power Systems and Machinery-Electrical Fault Analysis in Mechanical Systems*	Dr. Kamalakanta Muduli	In-progress
Romb Kuri	MEngg	*Improvement in Production Quality in the Food Processing Sector*	Dr. Kamalakanta Muduli	In-progress
Bonifasio Kaupa Tandago	MEngg	*The Study of Geo-Thermal Potential in PNG & Its Advantages over Other Renewable Energy Technologies*	Dr Shoeb Ahmed Syed and Dr Bikash Ranjan Moharana	In-progress
Norman Gilbert	MEngg	*Production & Evaluation of Natural-Synthetic Reinforced Polymer Composites*	Dr. Steve Ales	In-progress
Hood Peara	MPhil	*Design of a Limestone Slurry Pipeline System for Gold Mines*	Dr. Steve Ales	In Progress

Funded Staff Research and Development Projects

Project Title and Number:	*Preparation of Al-based Metal Matrix Composites Through Powder Metallurgy Method and Evaluating its Suitability for Various Application in Corrosive Environment*
Funding Source (PNGUoT/External): If external, specify.	PNGUoT
Project Duration:	1 year
Funding Amount:	23,000 PGK
Project Team:	Team Leader: Dr. Bikash Ranjan Moharana Team Members: Dr. Kamalakanta Muduli, Dr. Shoeb Ahmed Syed, and Dr. Steve Ales
Outputs, Outcomes and Key impacts:	Development of lightweight and cost-effective composite materials for engineering applications. International publication.

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Dr. Kamalakanta Muduli	Editorial Board Member	IJPNGUoT	PNGUoT	2024-2025
Dr. Kamalakanta Muduli	Guest Editor	EAI Endorsed Transactions on Internet of Things	European Alliance for Innovation	2025

Dr. Kamalakanta Muduli	Reviewer	Journal of Cleaner Production, Cleaner and Responsible Consumption, Journal of Manufacturing Processes	Elsevier	2025
Dr. Khazar Hayat	Reviewer	The 10th International Conference on New Energy and Future Energy Systems (NEFES 2025	The Institution of Engineering and Technology (IET)	2025
Dr. S. Ales	Editor	Materials Science and Engineering: A	Elsevier	2025-2026
Dr. S. Ales	Reviewer	Rotor Journal	Department of Mechanical Engineering, University of Jember.	2023-2026
Dr. S. Ales	Reviewer	American Journal of Materials Science & Engineering	Science and Education Publishing (SciEP)	2017-2026
Dr. S. Ales	Reviewer	Intermetallics	Elsevier	2025-2026

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
Dr. Kamalakanta Muduli	Fellow	Institution of Engineers India	India	2025
Dr. Kamalakanta Muduli	Annual Member	The American Society of Mechanical Engineers	USA	2025
Dr. Shoeb Ahmed Syed	Annual Member	The American Society of Mechanical Engineers	USA	2025
Dr Aezeden Mohamed	Annual Member	The American Society of Mechanical Engineers	USA	2025
Dr. Bikash Ranjan Moharana	Annual Member	The American Society of Mechanical Engineers	USA	2025
Dr. Kamalakanta Muduli	Faculty Advisor	IEOM PNGUoT Student Chapter	USA	2025
Dr. S. Ales	Member	Society of Materials New Zealand Incorporated (SMNZI)	NZ	2017-2026

Research Outputs
Journal Articles

Acharya, A., Mohanty, A., Dash, M., Mishra, B. R., Muduli, K., & Swain, S. (2025). Analysis of overall customer satisfaction towards bancassurance in emerging economies. *International Journal of Indian Culture and Business Management*, *34*(4), 504–525. https://doi.org/10.1504/IJICBM.2025.145671

Apase, B. H., & Mohamed, A. (2025). Sustainability of Rural MSMES through Collaboration in the Menyamya District, Morobe Province. *Empirical Economics Letters*, *24*(Special Issue 4). http://www.eel.my100megs.com/volume-24-number-february-4-special-issue.htm

Bihari, A., Dash, M., Muduli, K., Kumar, A., Luthra, S., & Upadhyay, A. (2025). Sustainable Development Investment Decision: Do Environmental, Social and Governance (ESG) and Behavioral Biases Factors Matter? *Sustainable Development*, *33*(S1), 1161–1181. https://doi.org/10.1002/sd.70056

Bihari, A., Dash, M., Muduli, K., Kumar, A., Mulat-Weldemeskel, E., & Luthra, S. (2025). Does cognitive biased knowledge influence investor decisions? An empirical investigation using machine learning and artificial neural network. *VINE Journal of Information and Knowledge Management Systems*, *55*(2), 445–469. https://doi.org/10.1108/VJIKMS-08-2022-0253

Biswal, D. K., Moharana, B. R., & Muduli, K. (2025). Development of a Framework for Assessing the Degree of Course and Program Outcome Attainment utilizing Outcome-Based Education Framework. *Journal of Engineering Education Transformations*, *38*(3), 158–170. https://www.journaleet.in/index.php/jeet/article/view/2382

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SCHOOL OF MINING ENGINEERING

Head of School: Dr. Wilson Kobal

Introduction

The School of Mining is one of the four schools within the Faculty of Engineering at the Papua New Guinea University of Technology. It offers two undergraduate degree programs: the Bachelor of Mining Engineering (Honours) and the Bachelor of Mineral Process Engineering (Honours). In addition, the school provides postgraduate programs in Mining and Mineral Process Engineering. These postgraduate programs are primarily research-based and include the Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) degrees. To date, the number of top graduates who did postgraduate studies and took up academic positions in the school are few. Our graduates have had high preferences for employment in the industries owing to the high salaries and other benefits offered particularly by mining, resources and energy industries. This has seen less output in researches in the school over the years owing largely to lean academic staff strength that are often overloaded with teaching duties.

Among the academic staff of the School of Mining, 43% hold PhD qualifications, while the remaining staff members possess master's degrees and bring over 15 years of combined industry experience. The academic team is well supported by experienced technical staff with expertise in mining, mineral processing, extractive/resources engineering, resource geology, and mining environments.

Since 2022, the School has engaged external experts through adjunct professorships and online part-time lectureships to complement its in-house academic capacity. Notable contributors include Professor Ernest Baafi, Associate Professor at the University of Wollongong (Australia); Dr. Elaine Wightman of Queensland University; and Dr. Clara Abuntori, Mr. Emmanuel Buaba and Dr. Mawuko Ankah from the University of Mines and Technology (Ghana). Dr. Wightman is particularly involved in the supervision and co-supervision of postgraduate students. In addition, the school regularly invites practicing engineers from the mining industry to deliver lectures in the form of Master Classes, further enriching the students' learning experience with real-world perspectives. In 2025, Mr. Makat Katom from Ok Tedi Mining Limited and Mr. Bradley Vali from Newmont Mining Limited gave lectures to final year Mineral Processing and Mining students, respectively.

Currently, we have three (3) students enrolled in Master of Philosophy and one (1) in Doctor of Philosophy embarking on research in various areas in mining, mineral processing, hydrometallurgy, environment and other core related areas. Most of these research projects are industry based technical challenge projects.

The School of Mining has running MOUs with industry partners such as K92 Gold Mine, Mineral Resources Authority (MRA) as well as local alluvial resources landowners. It also fosters international research collaborations with University of Queensland (Australia), UNSW, Sydney, Harvard University, Curtin and James Cook University.

Research Focus

Our researches cover wide spectrum of areas but majority are technical challenges projects with focus on meeting industry needs. Our research strength is in the areas of mining or mineral resources extraction, resources evaluation, process design and optimization, comminution, process mineralogy as well as environmental solutions to mining-related waste and safety.

The main focus areas are;

1. Mining Engineering

- Mining Production Optimization
- Geological Modelling and Evaluation of Uncertainties
- Engineering Geology

- Geomechanics and Rock Mass Deformation and Behavior
- Alluvial Mining Techniques and Resources Evaluation
- Innovative Solution to Acid Rock Drainage (ARD) Associated with Mining Wastes
- Mineral Economics
- Mineral Taxation Policy
- Underground Mining Methods and Optimization
- Ore Reserve Estimation
- Rock Slope Stability Analysis

2. Mineral Process Engineering

- Process Mineralogy
- Comminution (including grindability)
- Froth Flotation Fundamentals
- Application of Froth Flotation
- Hydrometallurgy of Gold and Base Metals – Copper, Nickel, Chromium, Cobalt, etc.
- Process Plant Design & Optimization
- Froth Flotation of Base Metal Sulfides and Gold
- Process Data Analysis and Statistical Modelling
- Processing of Industrial Minerals
- Mine & Mill Waste Management
- Alluvial Gold Extraction, Process Optimisation with focus on Fine Gold Recovery and Elimination of Mercury (Hg)
- Gravity Concentration of Gold
- Gravity Concentration of Beach Sand Minerals
- Physical Processing of Beach Sand Minerals
- Pyrometallurgy
- Recovery of Rare Earth Elements (REE)
- Reprocessing of Mill Tailings

Staff Profiles

The Table below contains staff who are involved in research in the school.

Name	Designation	Research Expertise and Interests
Ken Ail (PhD)	Senior Lecturer	Mineral Economics, Taxation & Policy analysis, Exploration and mine planning management
John Witne (PhD)	Senior Lecturer	Mineral Processing, Extractive Metallurgy, Environmental Engineering, Small-scale Mining
Prasanna Kumar ((PhD)	Professor	Mineral Processing, Hydrometallurgy, Industrial Pollution Control Engineering, Surface Chemistry
David Pakne	Senior Technical Instructor	Ore Reserve Estimation, Mine Design, Bulk Material Handling, Small-scale Mining
David Seteri	Lecturer	Petroleum Engineering, Petroleum Geology, Reservoir Engineering, Drilling Engineering
Joseph Kotera Tera	Laboratory Manager	Catalysis and Reaction Engineering, Process Intensification and Optimization
Wilson Kobal (PhD)	Senior Lecturer	Chemical Engineering, Process Engineering, Inorganic Chemistry, Mineral Processing and Extractive Metallurgy

Major Professional Recognitions, Accomplishments and Awards

Name of the staff	Designation	Award/ recognition	Awarding body	Level (National/Regional/ International)
Mr. Joseph Tera	Laboratory Manager/PG student	Best Paper Award	Department of Chemical Engineering Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, Bharat	International
Mr. Brian Nokondopa	PG student	2nd Best Paper Award	Faculty of Post Graduate Studies, Research & Innovation, PNG University of Technology	National

Undergraduate Student Projects (BEMN4)

Student name	Project Title	Supervisor/s
Manau Bargel	*Maintenance Strategies for Bulk Materials Handling Equipment: Prolonging Equipment Life and Reducing Downtime of Conveyor Belt Systems*	Dr. Ken Ail, Mr. Tom Kiondi
Bartholomew Bigam	*The Geotechnical Challenges Associated with Lithologgy at Ok Tedi Mine Pit Walls*	Mr. David Pakne
Geiraga Dibura	*Investigating Options for the Future Mining of the Tolukuma Deposit*	Dr. Ken Ail
Jahley Gesia	*Cost Benefit Analysis of Haulage Options in Open Pit Mining - Factors influencing the Choice Between Trucks and Conveyors in Hidden Valley Mine*	Dr. Ken Ail
Dimasa Isei	*Realtime Blast Vibration Analysis & Optimisation - Lihir Gold Mine*	Mr. David Seteri
Bosip Johnny	*Optimization of Rock Fragmentation using Machine Learning Predictive Models*	Mr. David Seteri
Chris Julius	*Investigating the Role of Moisture Content in Fragmentation Efficiency*	Mr. David Seteri
Hayden Kaumb	*Using Artificial Intelligence (AI)-Driven Predictive Maintenance Systems for Haulage and Drilling Operations at Hidden Valley Mine, Papua New Guinea*	Dr. Ken Ail
Naomi Kawagle	*Optimization of Haul Truck Payload at Porgera Mine to Enhance Production Targets*	Dr. Ken Ail
Nenga Kepas	*Alluvial Mining Discount Cash Flow Model*	Dr. Ken Ail, Mr. David Pakne
Victor Kima Kivali	*Study of Different Explosive Compositions and Their Effect on Rock Breakage: Improving Overbreak Control Using ANFO and Optimized Blasting Parameters in Open-pit Mining*	Mr. David Seteri

James Komai	*Investigation Geotechnical challenges associated with Lithology in Porgera Open Pit Mine*	Mr. David Seteri
Moses Kuman	*Technical Evaluation of Predicted vs Actual Blast Fragmentation*	Mr. David Seteri
Melvian Kup	*Hydrate Inhibition in Oil Pipeline - Kutubu Oil Field: Investigation of Chemical Inhibitors*	Mr. David Seteri
Moses Miugle	*Cost Benefit Analysis of Rock Fragmentation Methods in the Global Mining Industry*	Mr. David Seteri
Ray Musum	*Truck Shovel selection with re-fleeting strategy at Ok Tedi Mining Limited*	Mr. David Seteri
Layton Nele	*Designing Mines Tailings Dam for Long-term Stability and Post-Mining Sustainability in Hidden Valley Mine: A Case Based on TDF1*	Dr. Ken Ail
Bradcilda Onde	*Active and Passive Treatment of Mine Tailings and their long-term Impacts on the Ok Tedi River*	Dr. Ken Ail
Thomas Pahau	*The Improved Drilling and Blasting Techniques Used in High Geothermal Ground Conditions at the Lihir Gold Mine*	Mr. Bradley Vagi
Senginau Penkesifu	*Determining the Drill Deviation Factor of Longhole Drilling in Porgera Underground Gold Mine*	Mr. David Seteri
Junior Pyakara	*Integration of Existing Underground Haulage Systems to Belt Conveyor Systems for Optimizing Deep Underground Ore Transportation & Handling in Porgera Underground Mine*	Mr. David Pakne
Joshmarie Ronald	*Mine Ventilation Challenges in Narrow Vein Mining: A Case of K92 Mine*	Mr. David Pakne
Graham Sailas	*Innovative Waste Rock Management & Tailings Disposal Strategies for Sustainable Mine Life Extension at OTML*	Dr. Ken Ail
Jesper Simeon	*Optimisation of Blasting Parameters for Improved Fragmentation: Newmont*	Mr. David Pakne
Kahanitti Sione	*Proposed Hybrid Ventilation System for Underground Mines in PNG: Case of K92 Mine*	Mr. David Seteri
Elijah Joel	*Geotechnical Challenges Associated with Lithology at Porgera Underground Mine*	Mr. David Seteri
Agaigi Tavake	*Techniques of Production Drilling in High Thermal Litology - Lihir Gold Mine*	Mr. David Seteri
Neuh Temmie	*Economic Analysis of a Conveyor System vs Trucking at K92 Mine*	Mr. David Seteri
Ross Thomas	*Addressing Uncertainities in Slope Stability Analysis: A Case Study*	Mr. David Seteri
Frank Veapi	*Mine Ventilation Challenges Faced by New Porgera Underground Mine*	Mr. David Seteri
Elijah Andrew	*Evaluating the Efficiency of Production Drilling in terms of Cost, Penetration Rate, Rock Breakage and Lithology of Open Pit Mines*	Dr. Ken Ail, Mr. David Seteri
Bradley David Walo	*Fragmentation efficiency: investigating pre splitting, Cushion Blasting, and Smooth Blasting Techniques in Mining*	Mr. David Seteri

BEMP4 Student Projects

Student name	Project Title	Supervisor/s
Natalie Aka	*Reflotation of K92 Cleaner Tailings*	Mr. Francis Kisai
Jeremy Alex	*Optimising Combined Gold-Copper Batch-Flotation Recovery and Grade at K92 Mine by Reducing Sliming Effects of Recycled Cleaner Tailings*	Dr. John Witne
Mary Arua	*Effect of pH in the Flotation of Sulfide Minerals*	Dr. Wilson Kobal
Kaiol Bigiding	*Determining GRG Component of K92 Mine Mill Feed & the Effects of Operating Variables Involved: Gravity Recovery Optimization*	Mr. Francis Kisai
Jack Isaro	*Optimizing Partial Roasting Techniques for Selective Iron Removal from Copper Concentrates from K92 Mining Ltd*	Dr. Wilson Kobal
Graham Jonah	*Selective Flotation of Gold Bearing Pyrite of K92 Ore: Chalcopyrite Depression*	Dr. John Witne
Lekius Kuluvipa	Effect of pH on Pyrite Flotation	Prof. Prasanna Kumar
Headley Kumang	*Reduction of Talc in Copper Flotation Using Produced Depressant (Cassava)*	Dr. John Witne
Raylyn Kumie	*Leaching of Ok Tedi Mine Pyrite Concentrate with Nitric Acid Under Optimal Conditions*	Dr. Wilson Kobal
Milton Martin	*Investigate the Effects of Using different Frother Dosages in Refloating Pyrite Concentrate (Tails) for Copper Recovery*	Prof. Prasanna Kumar
Henrietta Morong	*Optimising Recovery Through Establishing Optimum Throughput & Float Residency Time*	Dr. Wilson Kobal
Jaydel Morris	*Effect of grind size on K92 Mine Ore*	Dr. John Witne
Sakias Moses	*Establishing Optimum Feed Density for Ok Tedi Pyrite Concentrate Thickener*	Dr. John Witne, Mr. Joshua Wagi (OTML)
Egi Nawae	*Optimizing Gold Recovery from Alluvial Gold ore in PNG*	Dr. John Witne
Imay Norman	*Effects of Different Grinding Mediums on the Flotation Behavior of Sulfide Ores*	Dr. John Witne
Jemimah Paisawa	*The Reprocessing of K92 Mine Tailings*	Dr. Wilson Kobal
Stacey Rawuth	*Optimizing CMC Dosage to Reduce Fluorite Content in Flotation Concentrate of the Kora Ore*	Mr. Francis Kisai
Aloisia Tsigese	*The Mineralogical Study of Kora Ore: Identifying the Top Five Minerals and their Effects on Flotation (K92 Mining Ltd)*	Dr. Wilson Kobal
Emmanuel Winura	*Removal of Fluorine from Copper Concentrate at K92 Mine*	Dr. Wilson Kobal
Maxmillian Yerinduo	*Establishing Kora Ore Bond Work Index – Impacts on Throughput and Grind size*	Mr. Francis Kisai

Postgraduate Student Projects

Student name	Program	Project Title	Supervisor/s
Brian Nokondopa	MPhil in Mineral Processing	*Reducing Cyanide Consumption for Gold-Silver Ores Containing Reactive copper using Glycine-Cyanide Synergistic Leaching*	Dr. Wilson Kobal Dr. John Witne
Joseph Kotera Tera	MPhil in Mineral Processing	*Removal of Copper from Aqueous Solution Using Garcinia cymose sp: A Waste Material*	Prof. Prasanna Kumar
Michelle Maiti	MPhil in Mineral Processing	*Ammoniacal Thiosulphate Leaching of Tailings Pyrite Concentrate Gold Ore at Ok Tedi Mine, Papua New Guinea*	Dr. Wilson Kobal Dr. Elaine Wightman
Stanley Rungwa	PhD in Mining	*Stabilization of Toxic Heavy Metal Contaminants in Porgera Mine Wasteland Using Phytoremediation Technology – Papua New Guinea*	Prof. Prasanna Kumar Prof. Ravi Naidu Dr. Ken Ail

Funded Staff Research and Development Projects

Project Title and Number:	*Hidden Valley Mine Closure Planning*
Funding Source (PNGUoT/External): If external, specify.	Hidden Valley
Project Duration:	1 year
Funding Amount:	Approximately K11,000.00
Project Team:	Dr. Ken Kaepae Ail as Independent Reviewer
Outputs, Outcomes and Key impacts:	1. Reviewer's Report 2. Recommendations

Project Title and Number:	*Development of Resource Evaluation Code of Practice for the Alluvial Mining Sector in Papua New Guinea*
Funding Source (PNGUoT/External): If external, specify.	Mineral Resources Authority (MRA)
Project Duration:	5-year period (To start in 2026)
Funding Amount:	Not available/Ongoing
Project Team:	Dr. John Witne (Processing Specialist) Dr. Ken Kaepae Ail (Mineral Economic and Management Specialist) Mr. David Pakne (Principal Mining Engineer and Team Leader)
Outputs, Outcomes and Key impacts:	1. Resource Evaluation Code of Practice 2. Undergraduate and post-graduate research students will be embedded in the pilot project.

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
K92 Mining Ltd	Papua New Guinea	Joint research and capacity building	2025	2026-2027	"Tookie Angus Memorial" Scholarship - one K92 Mining employee doing Masters under School of Mining Engineering at PNG University of Technology
Ok Tedi Mining Limited	Papua New Guinea	Training for students and staff on software, Rocsience, currently used by Mining Industries	2025	Ongoing	To start in 2026, students and staff of the School of Mining Engineering will be trained on the Rocscience Academic software

Research Outputs

Journal Articles

Kobal, W., Pepper, R. A., Alarco, J. A., Martens, W., & Couperthwaite, S. (2025). Production of ferric ammonium sulfate (FAS) dodecahydrate from pyrite (FeS_2). *Environmental Challenges, 18*, 101102. https://doi.org/10.1016/j.envc.2025.101102

Article Preprints

Ail, K. K. (2025). *Analysing the performance of mineral tax instruments of Papua New Guinea*. SSRN. https://doi.org/10.2139/ssrn.5015753

Ail, K. K. (2025). *A critical review of book: The taxation of mineral rent by Gaunaut Ross and Clunnies Ross (1983)*. SSRN. https://doi.org/10.2139/ssrn.5115432

Ail, K. K., Kolotein, P., Morinagu, E., & Barou, J. (2025). *Cost benefit analysis of re-developing the Panguna copper-gold mine in Autonomous Region of Bougainville*. SSRN. https://doi.org/10.2139/ssrn.5116099

Conference Presentations/Proceedings

Tera, J. K., Kumar, P. Y., & Lem, J. (2025, December). *Harnessing Garcinia cymose f. pendula leaf powder for eco-sustainable chromium biosorption*. In *Trends in Energy and Environmental Research for Sustainable Development*, Bilaspur, Chhattisgarh, India.

Ail, K. (2025, May). *Estimating the economic benefits of mining ABG's mineral policy and legislation development and community consultation* [Conference presentation].

Book Chapters

Kumar, P. Y., & Kobal, W. (2025). *The impact of digital tools on modern research practices: The role of institutional review boards (IRBs) in research ethics*. In *Advanced research techniques: Theories, methods and practices* (Vol. 2, pp. 86–92). AG Volumes. https://agvolumes.com/Books-AG/index.php/AGvolumes/article/view/327

FACULTY OF HUMANITIES

SCHOOL OF BUSINESS STUDIES

Head of the School: Dr. Adimuthu Ramasamy

Introduction

The School of Business Studies (SBS) is the largest of the thirteen academic schools at the Papua New Guinea University of Technology (PNGUoT), serving over 700 undergraduate and postgraduate students annually. These include Ph.D., M.Phil., Executive MBA (EMBA), and MBA students. SBS is a multidisciplinary school with a strong track record of producing national and Pacific regional leaders who have significantly contributed to both the private and public sectors for decades.

The school offers several undergraduate programs, including the Bachelor of Business in Accounting (BBAC), Applied Economics (BBAE), Information Technology (BBIT), and Management (BBMA). These programs are designed to equip students with the knowledge, skills, and competencies needed to integrate academic learning with real-world business practices over the course of their four-year studies. In addition to its undergraduate offerings, SBS also provides postgraduate programs, including Ph.D. programs in Information Technology, Accounting, Economics, Finance, and Banking; Master of Philosophy (M.Phil.) in Information Technology, Economics, Finance, and Banking; Master of Business Administration (MBA), Executive MBA (EMBA) and Master's programs in Accounting and Economics.

In addition, the School of Business Studies is developing other comprehensive postgraduate programs, including CPA-combined MBA, Master in IT, and Ph.D. programs in Management, which will be rolled out soon. All the programs of SBS are designed to drive PNGUoT's strategic visions and the government's development efforts, as well as push for regional and global competitiveness, innovation, and entrepreneurship in an increasingly complex business environment.

The school is also developing new postgraduate programs such as a CPA-integrated MBA, Master in IT, and a Ph.D. in Management, which are expected to launch soon. All programs are aligned with PNGUoT's strategic vision, the government's development goals, and the broader aim of fostering regional and global competitiveness, innovation, and entrepreneurship in an increasingly complex business environment.

SBS consists of both national and international academics who are dedicated, motivated, and committed to maintaining high-quality academic standards. The school emphasizes continuous innovation and the integration of digital technology into teaching and learning, supported by active industry engagement and participation in professional associations. Research is central to SBS's mission and serves as the foundation for producing high-quality graduates. This focus has helped foster a competitive research environment that meets both national and international standards.

The SBS currently has the Research Centre of Big Data Analytics and Intelligent Systems (BAIS) (founded in 2015) and the Centre of Innovation and Entrepreneurship (CIE) (founded in 2019). These centers provide the platform for research collaboration among national and international colleagues in the field of big data, big data analytics, Artificial Intelligence, business intelligence, intelligent systems, innovation, and entrepreneurship. BAIS circulated the ITCS-BAIS Vol 8, Issues 9-4 to its members and beyond to share the state- of-the-art big data analytics, data science, AI, and intelligent systems in 2024. BAIS has its presence at ResearchGate. In 2025, BAIS published 4 Preprints on big data, AI, big data analytics, business intelligence, and intelligent systems at https://www.researchgate.net/profile/Zhaohao-Sun/publications , a few of which have been indexed by Google Scholar. BAIS has drawn increasing attention in international academia.

The SBS's commitment to our students is evident in providing excellent learning opportunities aided by state-of-the-art ICT technology and support infrastructure. The SBS strives for excellence in teaching/learning, research, consultancy, and services to the community combined with innovation and interaction technological expertise necessary for progress. Our faculty is fully committed and engages in research and development, focusing on understanding the dynamics and innovations that shape the volatile business environment.

The SBS collaborates closely with many overseas universities, including University of New South Wales, Federation University, Charles Sturt University, and James Cook University of Australia, Handong University of Korea, and Hebei University of Science and Technology of China.

Research across the four main disciplines of the Department of Business Studies (DBS)—Economics, Management, Information Technology, and Accounting—is strongly encouraged. During the 2025 academic year, academic staff in the School of Business Studies (SBS) actively engaged in a range of research activities. The report shows a general increase in the number of peer-reviewed publications, which include journal articles, books, book chapters, conference papers, and preprints. Many of these have been indexed in major academic databases such as SCOPUS, ERA, ISI (SCI), and Google Scholar.

Despite this progress, stimulating, reactivating, and sustaining research passion and curiosity among academic staff—while increasing the output of high-quality, indexed research—remains a significant and ongoing challenge for SBS. Academic research performance is not only vital for enhancing the university's teaching capacity but also serves as a critical benchmark for national and international accreditation of both undergraduate and postgraduate programs.

Priority Areas of Research

The following are priority research areas identified by SBS:

1. Agricultural economics.
2. Artificial Intelligence and Data Science.
3. Big data analytics and artificial intelligence.
4. Economics and Financing of the Agro- based industries.
5. Digital citizen development.
6. Cloud computing & cybersecurity.
7. Economic development (income inequality and poverty) in Papua New Guinea.
8. Green marketing and Green HRM.
9. Higher education KPIs, strategic planning and funding.
10. Human capital and national development, marketing management.
11. Leadership management.
12. Small and Medium-Sized Businesses in Papua New Guinea.
13. Women entrepreneurship.

Staff Research Projects

SBS academic staff members as investigators have undertaken the following research projects in 2025.

Investigator	Project titles
Dr Adimuthu, R.	*A Study on Quality of Work-Life (QWL) And Its Influence on Job Satisfaction, Organizational Commitment and Overall Organizational Performance in the Premier Universities In PNG* *A Study on the Factorial Influence on Sustainable Small Business Enterprises (SMEs) Practices in PNG*
Dr Alamil, L.	*Strategic Implementation Management of SMEs*
Mr. Bomoteng, B.	*Financing in Tertiary Education in PNG; Managerial Accounting for Socio-Economic Development in PNG*
Gipe, G.	*Key Measures and Trends in Economic Development in Papua New Guinea, Key Opportunities, Challengers and Enablers for Economic Development in PNG*
Dr. Prabhakar, Akhilesh Chandra	*Sustainable and Inclusive Economic Development, Regional Economic Cooperation (Investment, Trade and Technology), Agricultural and Rural Development, Social Entrepreneurship Development, Macroeconomic Policy and Economic Development Related Issues and Challenges*
Mr. Kuusa, M.	*The Impact of Tax Evasion on Revenue Collection in PNG*
Mr. Naro, R.	*Digitisation of PNG's Informal Economy: Table Markets and SMEs; Preservation of Cultural Inheritance Through Digital Rights Management (DRM): Distributed*

	Ledger Technology (DTL) Smart Contracts; Feasibility Analysis of Policy Draft Via Datafication: PNG Context (Public Sector)
Ms. Pambel, F.	*Big Data Driven Cybersecurity for Securing Citizen and Society in PNG*
Prof. B. K. Surya Prakasha Rao	*Securities Markets and Pricing, Insurance Industry, Banking Sector and Mutual Fund Industry*
Prof. Sun, Z	*AI-Driven Social Development In PNG*
Dr. Viswanadham N.	*Tax Policy and Incentives Towards Rural SME Business a Critical Study; Impact of Management Accounting Practices in the Manufacturing Industry in PNG: A Survey Study*
Dr. Viswanadham N. & Mr. Kusa, M.	*Root Cause Analysis of Rural Entrepreneurial Finance Policy Failures*

These ongoing research projects are expected to lead into corresponding research outputs for SBS in 2026.

Research Interests

The following table lists the current research interests of SBS Staff.

Academic Staff	Research Interests
Ms Abraham, Lulu Bokutoai	Education and Labour Economics, Fiscal Policy, Governance, Development Economics
Dr Adimuthu, Ramasamy	Human Resource Development and Organisational Behavior Management, Leadership Management, Management of SMEs and Change Management
Dr Alamil, L.	Service Delivery Management of Local Level Government, Small and Medium Enterprises (SME) implementation, Eastern Highlands Province of PNG
Mr. Ambelye, John A.	Supply Chain Challenges of Fresh Food Marketing, Manufacturing in PNG - Supply Chain Challenges, Labor Productivity of Factory Workers in Lae, Billboard Advertising in PNG: Effectiveness and Challenges
Mr. Bomoteng, Bapa	Higher Education Financing and Management, Strategic Planning
Mr. Gipe, Gomi J	Economic Development in PNG, Development Economics, GDP and National Public Expenditure and their Impacts on Poverty in PNG, Income and Expenditure and their Impacts on Weight, Height and Body Mass Index (BMI)
Mr. Kale, Kaupa	Development Economics of Land Scarcity, Eviction and Urban Development, Sustainable Development Strategies in High-yielding Agriculture
Mr. Konafo, Ken	Small and Medium Enterprises, Online Marketing, Fresh Produce Marketing
Mr. Kuusa, Matthew	Impact of Tax Evasion, Revenue Collection Performance in PNG, PNG SME Sector
Mr. Naro, Rodney	Cybersecurity, Artificial Intelligence, Cloud Computing, network engineering and management.
Ms Pambel, Francisca	Big data driven cybersecurity.
Mr. Pinjik, Paul	Organizational ICT Security Policy, Cybersecurity
Prof. B. K. Surya Prakasha Rao	Securities Markets and Pricing, Insurance Industry, Banking Sector and Mutual Fund Industry, Financial Inclusion and Sustainable Development, Entrepreneurship Development, Taxing and Tax Research, Gender Discrimination and Socio-Economic Effects in PNG

Prof. Sun, Zhaohao	Business Analytics and Big Data Analytics, Cybersecurity, Data Science, Artificial Intelligence, Cloud Computing
Mr. Tiki, Samson	Forensic Accounting and Investigation, Anti-money Laundering and Regulation, Financial Inclusion and Sustainability, Financial Forensic and Business Intelligence
Dr. Viswanadham, Nadiminti	Management Accounting, IFRS implementation, Environmental Accounting

Postgraduate Student Research

Student	Program	Research Title	Funding source	Supervisor
Kevin Uwapa Ivan	M.Phil	*Assessing the Impact of Financial Access, Business Information Networks, Entrepreneurial Traits, and Government Policies on the Performance and Sustainability of Registered Indigenous Small to Medium Enterprises in Goroka, Eastern Highlands Province*		Dr. Adimuthu Ramasamy
Pexcy Rodney	M.Phil	*The Impact of Resource Extraction on Local Economic Development in Papua New Guinea*		Dr. Adimuthu Ramasamy
Bapa Bomoteng	Ph.D	*Key Performance Indicators in Higher Education in Association with Funding and Strategic Planning*	PNGUOT (LNSDC)	Dr. Viswanadham Nadiminti
Peter Helebi	Ph.D	*Leveraging Socio-economic Development in PNG through Big Data Analytics: A Data Science Approach*	Self-funded	Prof. Zhaohao Sun
Mr. Mike Yandit	Ph.D.	*Exploring the Challenges of Financial Inclusion and Management on SMEs in PNG*	Self-funded	Dr Viswanadham Nadiminti
Mr. Mathis Piru	M.Phil in Accounting	*An Investigative Study of Tax Policy and its Implications on PNG Economy*	IRC (Internal Revenue Collection)	Dr. Viswanadham Nadiminti
Mr. Junior Rex	M.Phil	*PNG Coffee Sector Environmental Sustainability Issues*	Self-funded	Prof. S.W.S.B. Dasanayaka
Mr. Boyeb-Instructor	M.Phil	*DFI and MNCs Roles in PNG Economic Development*	Self-funded	Prof. S.W.S.B. Dasanayaka
Mr. Rex Jackson Hifu	M.Phil	*Digital Financial Services and Financial Inclusion in Papua New Guinea*	PNGUOT (LNSDC)	Prof. B. K. Surya Prakasha Rao

Undergraduate Projects

BBAC Program

Name	Project Title	Supervisor/s
Abdul Rahman Wahid Sumanjaya	*Does Corporate Social Responsibility Influence Earnings Management? Study of BSP Bank's in Papua New Guinea*	Dr. Viswanadham Nadiminti
Abner Juno	*Green Investment and Corporate Environmental Violations Evaluating the effectiveness of Green Finance in Mitigating Corporate Environmental Harm in PNG*	Dr. Viswanadham Nadiminti
Alexandria Maelin	*Influence of Financial Flexibility, Financial Distress, and Tax Policy on the Performance of Companies in PNG*	Dr. Viswanadham Nadiminti
Alce Romalus	*Tax Policies and Financial Inclusion on SMEs in Papua New Guinea*	Dr. Viswanadham Nadiminti
Andrew Yana	*Implementation of Financial Reporting Standard*	Dr. Viswanadham Nadiminti
Anne Marie Tarai	*System Review of Literature on IFRS Implementation in Banking System*	Dr. Viswanadham Nadiminti
Anne Rex	*Impact of Corporate Governance on Financial Performance of Financial Institutions*	Dr. Viswanadham Nadiminti
Anthonia Teboro	*Public Sector Accounting Practices in Papua New Guinea*	Dr. Viswanadham Nadiminti
Bathsuha Siloi	*Accounting Ethics and Financial Reporting Quality of SMEs*	Dr. Viswanadham Nadiminti
Bethanny Bernadette Michael	*Risk Assessment of Commercial Banks: A Quantitative Approach*	Dr. Viswanadham Nadiminti
Bijohn Dalokal	*The Cost of Debt and Environmental Information Disclosure on Firms in PNG*	Dr. Viswanadham Nadiminti
Celestine Geling	*Sustainable Banking in PNG: Unleash the Potential of ESG Media Reputation for Stable Financial Systems*	Dr. Viswanadham Nadiminti
Chessy Kennedy	*Financial Education and its Impact on Employee Productivity: A Study for Employees in Lae, Morobe Province*	Dr. Viswanadham Nadiminti
Christina Kelly	*The Impacts of International Financial Reporting Standards Adoption on the Value Relevance of Financial Reporting in Emerging Markets*	Dr. Viswanadham Nadiminti
Chynne Karagu	*Government Debt and Growth: The Role of R&D Cost*	Dr. Viswanadham Nadiminti
Daurisilia Pokea	*Firm's Capital Structure and its Impact on Financial Reporting Quality*	Dr. Viswanadham Nadiminti
Derold Falope	*Effect of Corporate Governance Mechanism and Dividend Policy in Two Major Banking Sectors in PNG (BSP and Kina Bank)*	Dr. Viswanadham Nadiminti
Emmanuel Camilus	*The Impacts of IFRS 16 on Earning Management: Evidence from Banking Sector in Papua New Guinea*	Dr. Viswanadham Nadiminti
Emmanuel Goga	*Monetary Operations and Government Debt Management Under Commercial Banking System in Papua New Guinea*	Dr. Viswanadham Nadiminti
Esther Onga	*Corporate Financial Performance of Manufacturing Companies in Papua New Guinea*	Dr. Viswanadham Nadiminti
Gloria Peke	*The Effective Role of the Management Accountant in Corporate Firms in Papua New Guinea*	Dr. Viswanadham Nadiminti

Gogoba Kamewo	*Impact of Auditor Independence and Expertise on Financial Reporting Quality in PNG*	Dr. Viswanadham Nadiminti
Grace Magaga	*Family Firms Performance and Earnings Management in Papua New Guinea*	Dr. Viswanadham Nadiminti
Grace Patrick	*Firms Attributes and Financial Reporting Quality of Listed Companies in PNG*	Dr. Viswanadham Nadiminti
Grace Paul	*Equity Returns and Investors Sentiment – Evidence from Global Market*	Dr. Viswanadham Nadiminti
Ismael Simon	*Financial Reporting Quality and Disclosure of Off-Balance Sheet Financing*	Dr. Viswanadham Nadiminti
Jamie Watnan	*Exploring the Impact of CSR Dimensions on Firm Performance in Papua New Guinea: A Fuzzy-set Qualitative Comparative Analysis Approach*	Dr. Viswanadham Nadiminti
Jeffery Tanda	*Assessment of Government Expenditure and Financial Accountability in Local Level Governments*	Dr. Viswanadham Nadiminti
Joan Pius	*Accounting Mechanisms Used in Microfinance Institutions*	Dr. Viswanadham Nadiminti
Jordan Tambi	*Management Accounting Practices of Commercial Banks in Lae, Papua New Guinea*	Dr. Viswanadham Nadiminti
Jordy Kuk	*Systematic Risks and its Determinants in PNG Banks*	Dr. Viswanadham Nadiminti
Jude T	*Systematic Risks and Its Determinants in PNG Banks*	Dr. Viswanadham Nadiminti
Kapak Maruya	*Budget and Budgetary Control Practices of Private Companies in Lae, PNG*	Dr. Viswanadham Nadiminti
Kingston Paul	*Papua New Guinea University of Technology School of Business Studies Final Year Project: Financial Analysis of Kina Bank*	Dr. Viswanadham Nadiminti
Lavina Hokogo	*Effect on Financial Reporting Quality and Auditing Committee Attributes*	Dr. Viswanadham Nadiminti
Lillian Raga	*Impact of International Financial Reporting Standard 9 on Proportion Key Audit Matters*	Dr. Viswanadham Nadiminti
Masi L	*The Case of PNG's Black Wednesday - Policy Roll-out vs. Implementation Failure*	Dr. Viswanadham Nadiminti
Mackella Mek	*Voluntarily Disclosure of Auditor's Information's and Stock Price Risk*	Dr. Viswanadham Nadiminti
Malina Terry	*Small and Medium Enterprises (SMEs) Tax Compliance and Procedures in Papua New Guinea*	Dr. Viswanadham Nadiminti
Manabiang Beneng	*Quality Financial Reporting in Higher Learning Institutions in PNG (University of Technology)*	Dr. Viswanadham Nadiminti
Marlin Caspar	*Financial Planning and Control Practices of Small and Medium Enterprises In Papua New Guinea*	Dr. Viswanadham Nadiminti
Martha Yopa	*Effect of Corporate Governance Mechanism on Financial Reporting Quality*	Dr. Viswanadham Nadiminti
McDaline Raynold	*A Critical Study of Microfinance and Its Role in Economic Development of Papua New Guinea*	Dr. Viswanadham Nadiminti
Melisha Slaibot	*Investment Inefficiencies and Financial Constraints*	Dr. Viswanadham Nadiminti
Merolyn Pora	*Seed Capital Challenges for SMEs in Papua New Guinea*	Dr. Viswanadham Nadiminti
Miriam Bimbi	*Financial Analysis of Commercial Banks*	Dr. Viswanadham Nadiminti

Naime Sisia	*The Impact of IFRSs Adaptation on Stock Liquidity: Evidence from Papua New Stock Exchange*	Dr. Viswanadham Nadiminti
Natasha Anuma	*Inventory Management Techniques in Manufacturing Companies in Papua New Guinea*	Dr. Viswanadham Nadiminti
Nathaniel Wama	*The Cost of Financial Fraud Victimization in Papua New Guinea*	Dr. Viswanadham Nadiminti
Nicole Philip	*Auditor Attributes and Financial Reporting Quality of Listed Mining Companies in PNG*	Dr. Viswanadham Nadiminti
Paula Mabiria	*Working Capital Management & its Impact on Profitability of Commercial Banks in Papua New Guinea*	Dr. Viswanadham Nadiminti
Paulina Kilts	*Depreciation Accounting Practices in Manufacturing Companies-Papua New Guinea*	Dr. Viswanadham Nadiminti
Paulson Ama	*The Quality of Audit Report for Government Owned Companies in Papua New Guinea*	Dr. Viswanadham Nadiminti
Philip Yambaki	*Best Accounting Practices in the Manufacturing Companies in Papua New Guinea*	Dr. Viswanadham Nadiminti
Pingping Omole	*Major Logging Operator K140m Tax Evasion: How Millions Slip Through the Forests of PNG*	Dr. Viswanadham Nadiminti
Rachael Leo	*Investment Decision by Small Investors in Papua New Guinea*	Dr. Viswanadham Nadiminti
Rebecca Andrew	*Financial Reporting Quality of Manufacturing Companies in Papua New Guinea*	Dr. Viswanadham Nadiminti
Sandra Segi	*A Systematic Literature Review on the Impact of Fintech and Financial Literacy*	Dr. Viswanadham Nadiminti
Stephanie Wapi	*Challenges of Tax Collection Survey from Lae City*	Dr. Viswanadham Nadiminti
Talitha Andaija	*Debt Diversification and Financial Flexibility*	Dr. Viswanadham Nadiminti
Tanisha Jack	*Determinants of Financial Stability of Commercial Banks in Papua New Guinea*	Dr. Viswanadham Nadiminti
Tettelia Giheno	*The Role of Supplier Management Practices in Circular Economy – A Supply Chain Perspective*	Dr. Viswanadham Nadiminti
Theresa Gavera	*Accounting Practices for Unorganized Sector – A Case of SME Sector in Papua New Guinea*	Dr. Viswanadham Nadiminti
Tiara Stanley	*Audit and Financial Communication Quality: Audit Quality and its Impact on Firm Performance*	Dr. Viswanadham Nadiminti
Venessa Ponah	*Report Practice of International Financial Reporting Standard (IFRS) in the Coffee Industry of Papua New Guinea*	Dr. Viswanadham Nadiminti
Wilson Baliawe	*Collateral -Based Monetary Policy -Evidence from Papua New Guinea*	Dr. Viswanadham Nadiminti

Research Outputs

Journal Articles

Appana, S. M., Bathini, H. B., Paramaiah, C., Katragadda, R., Rao, B. K. S. P., & Pasupuleti, R. S. (2025). Assessing the competencies of engineering students in generic skills: Insights from India. *Asian Journal of Interdisciplinary Research*, *8*(2), 187–202. https://doi.org/10.54392/ajir25212

Dasanayaka, S., Naida, N., Michael, T. G., & Rex, J. (2025). Identification of economic benefits of taro cultivation for small-scale farmer communities in Papua New Guinea: A study based on Markham District in Morobe Province. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2), 176–185. https://doi.org/10.63900/9wwyyv32

Dogiparthy, R. K., & Rao, S. P B. K. (2025). Managerial challenges and strategic prospects of granite enterprises in Andhra Pradesh. *International Journal for Multidisciplinary Research*, *7*(5). Article IJFMR250556414. https://doi.org/10.36948/ijfmr.2025.v07i05.56414

Gipe, G. J. (2025). A socio-economic development of PNG and Mozambique from 1975 to 2025: A statistical analysis. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2), 186–195. https://doi.org/10.63900/bberft69

Peter, R.D. (2025). Digital health transformation in Papua New Guinea. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2), 60–69. https://doi.org/10.63900/17hb8674

Prabhakar, A. C. (2025). Corporate management in the digital age: Harnessing automation, robotics, and AI in the Fourth Industrial Revolution. *Review of Socio-Economic Perspectives, 10*(1), 27–43. https://doi.org/10.2478/rsep-2025-0003

Prabhakar, A. C., & Shah, M. A. (2025). Asia's economic emergence through the prism of production function, international trade dynamics, and investment trends. *Journal of Social Protection Research, 6*(1), 101–120.

Prusty, R., Dash, M., Nath, S. C., Shadangi, P. Y., Muduli, K., & Ramasamy, A. (2025). Unveiling influential aspects shaping consumer post-purchase satisfaction in the consumer durables sector in the context of sustainable attributes. *International Journal of Indian Culture and Business Management*, *36*(4), 521–541. https://doi.org/10.1504/IJICBM.2025.150431

Sun, Z., & Pambel, F. (2025). A calculus of artificial intelligences. *Journal of Artificial Intelligence & Cloud Computing*, *4*(6), 1–10. https://doi.org/10.47363/w4yt8714

Sun, Z., & Panakal, J.J. (2025). Special issue of IJPNGUoT on the 50th year of independence of PNG: An editorial perspective. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2), i. https://doi.org/10.63900/xq9x1w25

Wei, X., & Sun, Z. (2024). Responsible big data analytics for enhancing e-business services. *Journal of Artificial Intelligence & Cloud Computing*, *3*(4), 1–9. https://doi.org/10.47363/JAICC/2024(3)370

Books

Prabhakar, A. C. (2025). *Rural social entrepreneurship development: Network-based manufacturing system model*. IGI Global. https://doi.org/10.4018/979-8-3693-7515-0

Prabhakar, A. C., Erokhin, V., Kuperan, K., & Yu, P. (2025). *Sustainable and inclusive economic development: A global perspective*. Apple Academic Press (CRC Press/Taylor & Francis).

Yu, P., Wong, S. K. M., & Prabhakar, A. C. (2025). *AI strategies for social entrepreneurship and sustainable economic development*. IGI Global. https://doi.org/10.4018/979-8-3693-6392-8

Book Chapters

Prabhakar, A. C. (2025). AI strategies for sustainable development goals: Collective action for poverty alleviation. In *AI strategies for social entrepreneurship and sustainable economic development*. IGI Global. https://doi.org/10.4018/979-8-3693-6392-8.ch019

Prabhakar, A. C. (2025). Sustainable social entrepreneurship development: The role of artificial intelligence. In *Rural social entrepreneurship development: Network-based manufacturing system model*. IGI Global. https://doi.org/10.4018/979-8-3693-7515-0.ch005

Yu, P., Lu, Y., Prabhakar, A. C., Erokhin, V., Lu, S., & Guo, K. (2025). Network-enabled IoT applications for green, smart, and sustainable cities: Case studies of China. In *Rural social entrepreneurship development: Network-based manufacturing system model*. IGI Global. https://doi.org/10.4018/979-8-3693-7515-0.ch001

Preprints

Sun, Z. (2025). *Intelligences = expectations* (Version posted May 1, 2025). ResearchGate. https://doi.org/10.13140/RG.2.2.13301.49122

Sun, Z. (2025). *A calculus of cause–effect*. ResearchGate. https://doi.org/10.13140/RG.2.2.34553.99684

Sun, Z. (2025). *Artificial intelligence entities: Data, intelligences and analytics* (Version posted July 20, 2025). ResearchGate. https://doi.org/10.13140/RG.2.2.32834.29122

Conference Papers

Rao, B. K. S. P. (2025, February 14–15). Evolution of Indian stock market: A comparative study of BSE Sensex and NSE Nifty. In *Proceedings of the 4th International Conference on Innovation and Sustainable Business Practices in the Digital Era (ICSID 2025)*.

Rao, B. K. S. P. (2025, March 29–30). The impact of trade and economic policies on global supply chains in developing countries. In *Proceedings of the UGC International Conference on Global Trends in Supply Chain and Logistics Management*.

Rao, B. K. S. P. (2025, March 29–30). The role of ESG standards in shaping global trade and supply chain strategies. In *Proceedings of the UGC International Conference on Global Trends in Supply Chain and Logistics Management*.

Rao, B. K. S. P. (2025, July 2–4). The evolution of depositories in India: A comparative analysis of NSDL and CDSL. In *AGBA 2025 Proceedings*. Bangkok, Thailand.

Rao, B. K. S. P. (2025, July 2–4). Gold ETFs in India: A comparative study of gold ETF performance in the Indian capital market. In *AGBA 2025 Proceedings*. Bangkok, Thailand.

Rao, B. S. P., & Bathini, H. B. V. (2025, July 2–4). Cost–benefit analysis of Industry 4.0 investments. In *AGBA 2025 Proceedings*. Bangkok, Thailand.

Rao, B. S. P., & Bathini, H. B. V. (2025, July 2–4). Global financial crisis: From cracking depression to corking recession. In *AGBA 2025 Proceedings*. Bangkok, Thailand.

Sun, Z., & Pambel, F. (2025, July 1–3). From artificial intelligence to artificial intelligences. In *Proceedings of the 6th PIURN 2025 Conference*. Lae, Papua New Guinea.

Invited Talks/Presentations

Rao, B. K. S. P. (2025, March 29–30). *Invited speaker*. In UGC-sponsored international conference on global trends in supply chain and logistics management, Dr. Mullapudi Harichandra Prasad Institute of International Business Studies, Acharya Nagarjuna University, Guntur, India, in collaboration with International Multidisciplinary Research Foundation (IMRF).

National and International Outreach

Rao B.K.S.P. (2025, October 13–17). *Training on budget, budget justification, and peer review check* [Trainer]. PNG University of Technology, Lae, Papua New Guinea. Participants: 30.

Rao, B. K. S. P. – Editorial roles: Member of editorial boards for multiple international journals

Sun, Z. Editorial board memberships:

- Editors-in-Chief, *Interdisciplinary Journal of PNG University of Technology*
- Editor, *Journal of New Mathematics and Natural Computation* (SCOPUS, WoS indexed). http://www.worldscientific.com/worldscinet/nmnc
- Editorial Review Board, *Journal of Computer Information Systems* (SCOPUS, WoS/SCI indexed)
- Associate Editor, *Journal of Intelligent and Fuzzy Systems* (SCOPUS, WoS indexed)
- Associate Editor, *International Journal of Systems and Service-Oriented Engineering (IJSSOE)* (DBLP, ACM indexed)
- Associate Editor, *International Journal of Business Intelligence Research*. http://www.igi-global.com/journal/international-journal-business-intelligence-research/1168
- Associate Editor, *International Journal of Risk and Contingency Management (IJRCM)*

2. Sun, Z. (2025). Participation in program committees and paper reviewing. Actively involved in organizing international conferences including ICAART 2025 and ICEIS 2025; reviewer for multiple journals and conferences.

Memberships of Professional Associations

Alamil, L. (2023–present). Senior Lecturer, Fellow, Institute of Public Accountants, Australia International. ORCID: 0000-0001-5663-6399.

Rao, B. K. S. P. – Memberships:

1. Indian Commerce Association (ICA), India – Life Member
2. Indian Council for Business Education (ICBE), India – Life Member
3. Accounting and Finance Association of Australia and New Zealand (AFAANZ) – Annual Member
4. Other Professional Memberships:
    - American Economic Association, USA – Full Member
    - Chartered Institute of Transport and Logistics, UK – Member
    - Chartered Institute of Highways and Transport, UK – Fellow
    - Network of Asia Pacific Schools and Institutes of Public Administration and Governance (NAPSIPAG), Malaysia – Full Member
    - International Association for Research in Income and Wealth (IARIW), Canada – Full Member
    - International Association of Maritime Economists, Canada – Full Member
    - Sri Lanka Association for the Economists and SLAAS, Colombo – Full Member

Sun, Z. – Professional Memberships:

- Senior Member, Australian Computer Society (ACS), Australia
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
- Distinguished Member, Association for Information Systems (AIS)
- Member, Association for Computing Machinery (ACM)

Nadiminti, V. – Professional Memberships:

- Life Member, Indian Finance Association
- Member, Accounting and Finance Association of Australia and New Zealand (AFAANZ)

SCHOOL OF COMMUNICATION AND DEVELOPMENT STUDIES

Head of the School: Dr Rachel Aisoli-Orake

Introduction

As concerns *teaching activities*, the School of Communication and Development Studies (SCDS) offers a 4-year professional program that has two sections: An optional service-course sequence in English for Academic Purposes (EAP) for students across all disciplines of the University, and a professional Communication for Development (C4D) degree program designed to train liaison and community development and public relations officers for resource development companies, government departments, and non-government organizations. It also presently administers the Postgraduate Certificate Course in Student-Centered Teaching (PGCSCT) for a further specialized training of academic staff at the Papua New Guinea University of Technology (PNGUoT) with the University's Teaching and Learning Unit (TLMU), as well as a soft-skills lunchtime lecture program for both undergraduates and postgraduate students, sponsored by a nascent Academic Resource Center (ARC).

In 2009, the school began offering a Master in Communication Studies (MCS) program. This program has both coursework and a dissertation component, in which students write a research paper on an appropriate topic in their final semester of the second year. In addition, a Master of Arts in Organizational Leadership (MAOL) is periodically offered in cooperation with Development Associates International (DAI), The Christian Leadership Training College of Papua New Guinea (CLTC), and the Pioneers of Australia. (*Note*: Now this is in suspension because of funding issues, and is currently undergoing revision to make it sustainable.)

As concerns *research activities*, the SCDS blends three broad academic strands (EAP/Communication Studies, Sociology, and Communication for Development). Through its individual members of staff, research is conducted under two general umbrellas (Linguistics and Culture, EAP, English for Special Purposes (ESP); and Sociology, and Communication for Development).

In Linguistics and Culture, focus is given to PNG national languages, comparative linguistics, and the interface between society and language across time. In EAP or English for Specific Purposes (ESP), research topics include: Classroom research, EAP/ESP methodology, course design, material design, genre analysis, rights analysis, critical EAP/ESP, reading and writing, testing and evaluation, computer-mediated language learning, EAP/ESP research, and socio-linguistic influences on the teaching and learning of EAP/ESP.

In the general area of Sociology, research foci include fieldwork, health, communication theory and practice, media studies, critical-cultural studies, and comparative higher education studies. Another thread is concerned with the problems of youth in society, especially on topics such as integration, sex education, and social behavior. In the Communication for Development (C4D) area, the sub-topics of research interests include: communication in education, communication and gender, communication in resource management, conflict resolution, negotiation skills, partnership building, communicating development in such sectoral contexts as economic industries, healthcare, agriculture, etc., as well as democracy and human rights, and HIV/AIDS.

Both empirical (quantitative or qualitative) approaches to relevant topics are employed by our academics, with trans-disciplinary innovations (such as action research) encouraged. The school publishes an international peer-reviewed organ, the *JCDS: Journal of Communication and Development Studies* under the editorship of Professor Gilder, in cooperation with the UNESCO Chair of Quality Management of Higher Education and Lifelong Learning of "Lucian Blaga" University of Sibiu, Romania, and its Director, Prof *habil*. Dr Silvia Florea.

Research Interests of the Faculty Members

Name	Position	Research Interests
Prof Dr *habil*. Eric Gilder	Professor, Editor-in-Chief, *JCDS*	Higher Education Policy, Scientific Communication, Technology and Society, Communication Theory and Practices Across Intercultural Contexts, Radio-TV History and Legal Aspects of Broadcasting and the Socio-Psychological Aspects of the Communication Process
Dr Madan Mohan Laddunuri	Professor	Sociological Theory, Education, Community Development, Public Administration and Management, Pacific Island Studies, Organizational Change, Tourism Management, Health Demographics
Dr Rachel Aisoli-Orake	HoS, Senior Lecturer	English as a Second Language Writing, Education/English Curriculum and Pedagogy, English for Academic Purposes, Cross-Cultural Communication, Development and Responsibility, Participatory Research
Michael Winuan	D/HoS, Lecturer II	English for Academic Purposes, Farming and Community/National Development
George Wrondimi	Lecturer II	Social Work; Social Policy and Planning; Social Mapping; Community Development
Imelda Ambelye	Lecturer I	Education and Community Empowerment (Women and Youth), Natural Resources (Mining and Other Extractive Industries) in PNG
Joshua Frank Kuri	Lecturer I	Language Development and Practices via Bilingual Education; Practices and Effects of Communication across Developing Societies, Disaster and Risk Management, Workplace Safety and Risk Management
Nagiob Jesse	Lecturer I	Engineering and Sustainable Development Practices, Research Methods and Skills, Workplace/Business Communication, Development Studies, Communication for Development, Socio-economic Development Research, Strategic Planning, Implementation, Monitoring and Evaluation
Lucy Maino	Lecturer II	Participatory Development Communication (PDC) for Engaging Stakeholders (Individuals, Groups, and Institutions) in Socio-Economic Change Processes, Participatory Social Mapping for Community Development, Environment and Agricultural Innovation, English for Academic Purposes (EAP)
Sheryl S. Makara	Lecturer I	Emotional Intelligence and Leadership, Critical Thinking, Communication in Crime, Sociology in Relations to Development, Community Development and Participation
John Milba	Lecturer I	Sports as a Vital Tool in Behaviour Change of Young People in Communities: A Perspective of Rugby League, Development from a Perspective of Guided Strategy: A Perspective of a Developing Nation - Papua New Guinea; Urban Sociology in Consideration of Sustainable Development Goals

Ruth Moka	Lecturer I	English for Academic Purposes, Community Development, Secondary Education in PNG.
Wilma M. Langa	Lecturer I	Sociology of Children, Sociology of Deviance and Crime
Dr. Clara B. Reshma	Senior Lecturer	English for Academic Purposes, Literature and Cultural Studies, Communication Studies
Jeremiah Iko	Tutor (Part-Time)	Communication for Development
Starza Paul	Lecturer I	Journalism Theory and Practice; National Development
Jack Yaro	Lecturer I	Development, Work and Safety Training
Ian Yengki	Lecturer I	Sustainable Practices in Development.

Partnerships and Community Engagements

Industry Partnerships – Key Collaborations with Private Sector / Government / NGO

Memorandum of Understanding (MOU)

- National Gaming Board (PNG)
- Mineral Resources Development Company (MRDC) – Scholarships & Capacity Building
- Chongqing Normal University, China & Papua New Guinea University of Technology (PNGUoT) – Jointly cultivating undergraduate students in International Chinese Language Education

Memorandum of Agreement (MOA)

- Grow PNG Ltd – Training of Trainers program

Community Impact Projects – Outreach, Awareness, and Initiatives

- Ragitamut Community Water Supply (Mutzing District) – Facilitated engagement through ATCDI
- Sankwep Investment Ltd Limestone Project (Nabag) – Social mapping, clan vetting, and environmental impact assessment; proposed collaboration between Schools of Commerce & Decision Sciences (SCDS), Survey & Land Studies (SSLS), and Faculty of Forestry (SoF)
- Patep Irrigation System – Collaborative initiative involving University of Goroka, National Agricultural Research Institute (NARI), ACIAR Research Director (Australia), PNGUoT SCDS, and Forest Research Institute (FRI)

Postgraduate Certificate in Student-Centered Teaching (PCSCT) 2025

Taught at the TLMU Center under the supervision of Prof Eric Gilder, the PCSCT consisted of the following modules, offered to nominated academic staff members at the University an expanded one-year pedagogical program meeting NQF Level 8: CD 511: LMS and Flipped Classroom; CD 512: Project/Problem-Based Learning, CD 513: International Trends in Higher Education Teaching and Learning, and CD: 514 Capstone Project. Four enrollees completed all subject requirements for the course, and will thus obtain a PG Certificate in April 2025: Twelve (12) enrollees completed all subject requirements for the course.

1. Professor Sulistyo Arintono
2. Dr Anayochukwu Victor Eze
3. Mr Lewi Kari
4. Ms Resila Karipal
5. Dr Maysam Khoshnavo
6. Mr Eroy Kotipe

7. Mr Galie Nanong
8. Ms Sophie Moke
9. Dr Kandasamy Piraparahan
10. Dr Rahelen Rostami
11. Professor Ahmad Sana
12. Mr Ian Yengki

Postgraduate Research Projects

Candidate	Program/Year	Supervisor(s)	Research Topic
Lucy Maino	PhD/3	Dr. Bue (Agriculture)/ Prof. Gilder	*Impacts of Integrated Development Approaches on the Livelihood of Rural People: A Case Study in the Oro Province of Papua New Guinea*
Tania Peter	MCS/4	Prof. Gilder/ Dr. Aisoli-Orake	*Assessing the Key Required Competencies of Public Relations Communication Practitioners in PNG Today: A Survey of PR Professionals Employed by UN-Accredited NGO's in Port Moresby*
Charles Alikang	MCS/3	Prof. Madan/ Ms. Ambelye	*Communication Strategies on Ploy Techniques Used by Asians to Succeed in Business in the Country: A Case Study of Success of Asian Businesses in Maprik District, East Sepik Province*
Joanne Yandimowal	MCS/2	Ms. Ambelye/ Prof. Gilder	*Strategic Communication for developing the Informal Economy Sector of the economy 2023: A Research on Impact of Media Strategies to Usage of Public Goods and Services by the Vendors of Urban and Rural Markets.*
Samuel Toully Gunua	MCS/1	Prof. Madan	*Fraud Claims and Their Effects on the PNG Motor Vehicle Insurance Industry: A Case Study on the Compulsory Third Party Insurance Requirement*
Izzabellah F. Homingu	MCS/1	Prof. Gilder / Dr. Aisoli-Orake	*Developing Strategies for Effective Communication and Mentoring to Improve Postgraduate Students Retention and Completion Rates: A Case Study at the PNG University of Technology*
Steve Langa	MCS/1	Prof. Madan / Prof. Gilder	*Analysis of Factors Contributing to the Delay of Major Road Construction Projects in Lae: A Case Study of the Yalu Bridge – Nadzab Four Lane Road Construction in Lae, Morobe Province*
Belinda Wambi	MCS/1	Dr. Aisoli-Orake / Prof. Madan	*Investigating the Cause of Poor Performance of Grade 12 Students in the National Examinations: A Case Study of Teachers and Students in the Eight Secondary Schools of Southern Highlands Province*
Tabitha Wosse	MCS/1	Prof. Gilder / Ms. Ambelye	*A Comparative Analysis on Public Relations Strategies in PNG Universities: A Case Study of Public and Private Universities*
Priscilla Menin	MPhil/2 (Forestry)	Dr. Moses/Dr. Aisoli-Orake	*Assessing the Socio-economic Impact of Forestry Pine Plantations on Local Communities: A Case Study of the Manki Clan of Papua New Guinea*

Undergraduate Research Project

CD 423: Dissertation – Communication & Deelopment

Names	Project Title	Supervisor
Albednego Peter	Comparative study on Employment rate Graduates from Accredited and Old Engineering Programs: A Study of Papua New Guinea University of Technology	Prof. Gilder
Anis Raymond	Bridging the Digital Divide: A Study of Computer Literacy in Communication and Development Studies	Prof. Madan
Anthony Stacy	The Mobile Phone Communication in Enhancing Agricultural Productivity for Smallholder Farmers in the Asoro Valley	Dr. Aisoli-Orake
Boi Belinda	An Investigation on the Second Seven Dump Site: Over-Used Dump Site, Affecting Environment and Surrounding Communities of PTC, Dump Area, Lae.	Dr. Reshma
Dekene Trisha	Adaptation of Social Media for Marketing and Customer Communication: A Survey of SME in Goroka Town's CBD	Mr. Wrondimi
Ghun Nathaniel	The Dual Impact of Early Enrollment Age and School Type an Academic Success: A Comparative Case Study of St. Peters Primary School and Bulolo International Primary School, in Morobe Province	Mr. Paul
Ibuku Micah	Financial Implication and Effects of Gambling on the Male Students Attending Papua New Guinea University of Technology.	Mr. Kuri
John Malai	A Study into Understanding the Cause of Unemployment in Lae	Mrs. Langa
Johnny Winston	Bio-Gas Technology Installation at PNG Unitech Farm for Sustainable Energy	Mr. Sefo
Kiak Williana	Analyzing the Relationship Quality Water Supply and Health Outcomes of Kel Bire Community, Gumine District, Simbu Province	Mrs. Moka
Kiramu Mark	A Study into Child Abuse in the Lower Primary Schools of Atzera LLG, Markham District Morobe Province	Mr. Jesse
Kisai Elizah	An Investigative Study into the Socio-Economic Factors of Simple Appropriate Technology in Community Livelihood: A Perspective from the Charcoal Stove Usage in the Suko and Taraka Communities, Morobe Province	Mr. Milba
Laurie Keidi	An Investigation into the Role of the Youth Unemployment in Contributing to Petty Crime in Gerehu stage 6, in Port Moresby	Mr. Sefo
Liko Nadzeija	Impacts of Small & Medium Sized Enterprises on the Livelihood of the Locals: A Case Study of Kainantu Urban LLG	Mr. Milba
Maino Leowina	Communication Dynamics of Betelnut Trade in PNG: A Case Study of Betelnut Trade between Oro and Morobe Province	Mr. Yaro
Manu Alexandrea	Overcoming Culture Misconceptions as Barriers to Contraceptive Use through Culturally Sensitive Messaging	Mr. Yengki
Manuki Delma	Exploring the Negative Impact of Facebook on Students Performance and Academic well-being. A Case Study of Primary and Secondary Schools in Lae City	Prof. Gilder
Manko Rachael	Harnessing Digital Communication Tools for Small Business Growth in Lae, Morobe Province	Prof. Madan
Matawi Polalau	Exploring Local Fishers' Perceptions of Fishing Ground Depletion in the Relation to Population Growth in Pere Village	Dr. Reshma

Mimpi Pius Jnr	A Survey to Identify the Needs to Address Cocoa Pest and Diseases in Cocoa Production in Arabaka LLG and Usino LLG of Madang Province	Mr. Wrondimi
Murray Samantha	Financially Empowering the Local Artisanal Fisherman from Sustenance to Generating Community Wealth; A Case Study on Finschafen, Nasing Village, Obahsigah	Mr. Paul
Nutkena Samantha	Strengthening Participatory Communication Strategy to Address Community Concern on Deep Sea Tailing Placement (DSTP) in the Wafi-Golpu Mining Project, Morobe Province, PNG	Mr. Kuri
Nyalya Jayson	Adolescent Wellbeing through Positive Parenting: A Case Study of Parents, Caregiver of Adolescent at East Taraka Community	Dr. Reshma
Ogi Honong	A Study on Factors Affecting Delivery of Quality Basic Education in Morobe	Mrs. Langa
Pape Aki	A survey to Identify the Permanent Needs of Graduation Hall to Graduate at the Papua New Guinea University of Technology, Lae: PNG	Mr. Sefo
Paliwa Pierre	Challenges and Support Mechanism for Internally Displaced Person: A Case Study of Bulolo Care Center	Mrs. Moka
Pena Moses	Addressing Drug(marijuana) Abuse Among Young People. A Case Study on Drug Abuse Among Youths in Anglimp LLG, Jiwaka Province, Papua New Guinea	Mr. Jesse
Porikura Timothy	A Study on the Juvenile's Crime and its Impact on the Development in Kimbe, West New Britain (WNBP)	Mr. Milba
Ruku Elizabeth	Assessing the Role of effective Communication in Addressing Escalating Crime Issues in Lae City: A case study of East Taraka	Mr. Yaro
Simatab Jessica	The Importance of Strategic Communication in Managing and Mitigating Power Outcome in Ega Kundiawa Town	Mr. Yengki
Susame Kenneth	Improving Health Care Service Delivery for Student and Staff of PNG University of Technology: A Case Study on the PNG University of Technology (PNGUOT Clinic)	Prof. Gilder
Tanabi Ashley	How Mental Health Issues Can Affect Students' Social Life and Academic Performance?	Mr. Paul
Vulupindi Nathalie	Assessing Process Challenges in Clan Bank Account Opening: A Case Study on PDL 1 Beneficiaries 2024-2025	Prof. Madan
Waiakali Javina	Addressing the Underlying Causes of Illegal Settlements in Port Moresby, 2025: A Case Study of Morota 1	Dr. Reshma
Weoh Eluh	Impact of Uncontrolled Population Growth on Development in Buala Village, Lae, Morobe Province	Mr. Kuri
Fakila Rachael (O)	An Assessment of Fire Safety Preparedness in the Papua New Guinea University of Technology Staff Residence	M.r Milba

Research and Innovation Highlights

Paul, S. (2025–2028). *The sago food security project: Developing an inclusive co-design process for strengthening food security in Western Province, Papua New Guinea* [Ongoing research project]. Conducted in collaboration with Australian Centre for International Agricultural Research (ACIAR), University of Canberra, Western Sydney University, Victoria University (New Zealand), Papua New Guinea University of Technology, Divine Word University, and National Research Institute.

Paul, S. (2025). *Investigation of arms and ammunition smuggling into the Highlands of Papua New Guinea* [Ongoing research project]. Examines the increasing use of high-powered firearms and their socio-economic impacts on communities and property.

International Collaborations

Gilder, E. (2025). Ongoing collaboration with Lucian Blaga University of Sibiu (LBUS), Romania, including:
i. SCDS BACD degree quality benchmarking process (in collaboration with Professor Silvia Florea).
ii. Editorial contributions to *Journal of Communication and Development Studies (JCDS)* (co-editor: Professor Silvia Florea; next issue scheduled for 2026).
iii. External doctoral supervision and examination through the Institute for the Organization of Doctoral and Post-Doctoral Studies (IOSUD), where he has served as a habilitated professor (Philology) since August 2020.
iv. Delivery of an online Master's course in *Strategic communication and public relations*, in collaboration with East China University of Science and Technology (ECUST, Shanghai) and LBUS.

International Engagements & Outreach

Gilder, E. (2025).
i. Academic Coordinator, Scientific Council of the "Jean Bart" Chair, EUROLINK – House of Europe, Bucharest, Romania, contributing to lifelong learning initiatives in higher education and policymaker training.
ii. Recipient of a bespoke scholarly compilation titled *Education, communication, culture, and conscious governance: From evolutionary anthropology to participatory evolution*, presented by Adrian Zarif (Educational Trainer in Sociocracy), Bucharest, 7 November 2025.

Professional Development / Academic Participation

Langa, W. (2025, September 1–3). Participation in the *Asia Pacific Academic Mentoring Program*. Australian Academy of Science, Canberra, Australia.

Research Outputs

Journal Articles

Londari, Y., Paul, S., Rex, J., Anton, H., & Kambao, A. (2025). Post-COVID-19 assessment on perceptions, acceptance, and attitudes towards COVID-19 vaccines: A case of Papua New Guinea. *International Journal of Innovative Science and Research Technology*, *10*(9), 2572–2582. https://doi.org/10.38124/ijisrt/25sep1218

Paul, S., Sali, G., & Yaro, J. (2025). An assessment of Papua New Guinea (PNG) government's Connect PNG program: A socioeconomic survey of the Baiyer–Madang road. *Romanian International Journal of Politics and Social Sciences*, *22*(1), 167–183.

Langa, W., Thomas, V., Kauli, J., & Buys, L. (2025). Hybridity and safety: The lived experiences of market vendors in urban settlement communities in Lae, Papua New Guinea. *Journal of Cultural Geography*, *42*(3), 333–356. https://doi.org/10.1080/08873631.2025.2513185

Sali, G. (2025). Analyzing the evolution of rascal gang culture in Port Moresby, Papua New Guinea through the sociological imagination lens. *South Pacific Studies*, *45*(1), 1-26,

Sali, G. (2025). Redefining Papua New Guinea's Law-and-Order Path: Learning from the Past and Forging a New Approach in the 50th Year of Independence. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2), 4–23. https://doi.org/10.63900/2rd9sr39

Sali, G., Paul, S., & Yaro, J. (2025). Modernization and urbanization trends in Papua New Guinea with a particular focus on dynamics of rural–urban migration. *Romanian International Journal of Politics and Social Sciences*, *22*(1), 167–183.

Sali, G., Yaro, J., & Paul, S. (2025). An assessment of Papua New Guinea (PNG) government's Connect PNG program: A socioeconomic survey of the Baiyer–River road. *Romanian International Journal of Politics and Social Sciences*, *22*(2), 104–124.

Ssemugenyi, F., & Sali, G. (2025). Reassessing technology-enhanced learning: Striking a balance between technological integration and pedagogical effectiveness. *International Journal of Education and Practice*, *13*(4), 1424–1442. https://doi.org/10.18488/61.v13i4.4466

Books

Wrondimi, G. H. (2025). *Between two worlds: From childhood to manhood in Papua New Guinea*. Orange Books Publication, India.

Preprints

Paul, S. (2025). *Causes and effects of tribal warfare: A case of Kompiam conflict in Enga, Papua New Guinea*. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.5183071

Paul, S. (2025). The intriguing challenges of tribal warfare in Enga, Papua New Guinea: An integrated clan-based approach to maintaining peace, law and order. *SSRN Electronic Journal*.

Course Modules/Institutional Publications

Wrondimi, G. H. (2025). *Subject guide and course module (Project planning & management)*. PNG University of Technology Press.

Wrondimi, G. H., Milba, J., & Jesse, N. (2025). *Course module and training of trainer's course handbook for Grow (PNG) on conflict resolution and negotiation skills*. PNG University of Technology Press.

Conference Presentations

Avram, S., & Gilder, E. (2025, June 12–14). *Enacting an initiative Castalia to fulfill new teaching and learning demands amidst artificial intelligence (AI) and the emergence of artificial general intelligence (AGI)*. Education and Multiculturality Section, Romanian Ministry of National Defence, "Nicolae Bălcescu" Land Forces Academy, Sibiu.

Gilder, E. (2025, May 29–31). *Round table in memoriam Dr. Ana-Karina Schneider (late editor of the American, British and Canadian Studies journal)*. AICED-26: The 26th Annual International Conference of the English Department, University of Bucharest, Literature and Cultural Studies Section: *Writing in a world on fire: Perspectives on war and climate change*.

Gilder, E. (2025, September 17). *Introductory overview of CIO-SUERD conference*. European Roundtable for Educational Transformation, Bucharest, Romania (Online participation).

Langa, W. (2025, August 21–22). *The roles of the hybrid market and local responses implemented to address safety issues*. 2025 PNG Update, University of Papua New Guinea, Port Moresby.

Langa, W. (2025, July 1–3). *Creative visual research and local strategies for social change*. Pacific Islands Regional University Network (PIRUN), Papua New Guinea University of Technology.

Langa, W. (2025, November 25). *Creative visual research and Indigenous voices as ways of knowing local realities*. Global Conference: Indigenous Knowledge in Global Research: Celebrating and Amplifying Voice, Queensland University of Technology (Online participation).

Paul, S. (2025, July 1–3). *An assessment of Papua New Guinea (PNG) government's Connect PNG program: A socioeconomic survey of the Baiyer–Madang Road*. 6th Pacific Islands Universities Research Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Seminar/Invited Talk

Laddunuri, M. M. (2025, March 6). *Savings save you from difficulties and make you rich*. SCDS Seminar.

Langa, W. (2025, April 17). *Thesis update: Opportunities, benefits, and challenges of doctoral journey*. SCDS Seminar Presentation.

Reshma, C. B. (2025, September 2). *Effective communication*. PNGUoT Research Seminar.

Research Reports

Paul, S. & Sali, G. (2025). *Socioeconomic Impacts of the Baiyer–Madang Road* [Research report].

Workshop/Trainings

Langa, W. (2025, April 17). *Selecting top-level journals using Scimago* [Workshop]. SCDS Staff Training, Papua New Guinea University of Technology.

FACULTY OF NATURAL RESOURCES

SCHOOL OF AGRICULTURE

Head of the School: Professor Peter Manus

The School of Agriculture at Papua New Guinea University of Technology offers both undergraduate and postgraduate programs in Agricultural Science, including a Bachelor of Science in Agriculture (BSc.Ag) and a hybrid Bachelor of Agriculture and Rural Development (BAgRD), Masters by coursework (MSc. Ag) and research (MPhil) and Doctor of Philosophy (PhD). The School has 19 faculty members (14 PhD, 5 Masters) and annually graduates students across various programs. Its activities are outlined in Five-Year Strategic Development Plans (2005 – 2010, 2011 – 2015, 2016 – 2020, and 2021-2024), with a focus on quality teaching, research, and outreach. Presently with the PNGUoT's Strategic Plan 2025-2029, an implementation plan has been prepared to carry forward research activities. The curriculum involves stakeholder consultation for continuous improvement. Collaborative research links exist with international partners like ACIAR and various universities in Australia including Curtin University, University of Queensland, University of Southern Queensland and University of Canberra, and the region (University of South Pacific, Fiji National University) to enhance agricultural research. The school also publishes a scientific journal and reports, showcasing its commitment to research. Additionally, it has oversight of the Centre for Excellence in Biotechnology, University Farm and is affiliated with the Australian Council of Deans of Agriculture (ACDA) for benchmarking and accreditation purposes and the Asia-Pacific Association of Agricultural Research Institutions (APAARI).
The school identified the following research focus areas for the faculty members and student research, which are woven around these thematic areas:

Research Focus

Research Focus Area – 1: Crop Sciences

- Evaluation of promising rice varieties for Papua New Guinea
- Crop improvement and adaptation to climate change–induced stress environments
- Use of *Trichoderma* spp. as a biocontrol agent against selected soil-borne pathogens
- Studies on production technologies and farming practices for crops and vegetables across different agro-ecological regions of Papua New Guinea
- Soil nitrogen dynamics and composting in sweet potato–based farming systems
- Development of a maize seed system for Papua New Guinea
- Gene discovery in PNG wild rice, focusing on seed and grain characteristics
- Genetic transformation of taro and rice
- Quantification of greenhouse gas (GHG) emissions from soils under major cropping systems in Papua New Guinea
- Development of fungal inoculum for artificial agarwood production in Papua New Guinea
- Bioprospecting and biological control of insect pests using beneficial organisms
- Efficacy testing of pesticides (insecticides)
- Climate-smart insect-based waste management systems

Research Focus Area – 2: Livestock Sciences

- Conservation of farm animal genetic resources
- Utilization of crop residues and agro-industrial by-products for livestock and poultry feeding
- Assessment of digestibility of locally available feed and fodder resources
- Evaluation of anti-nutritional factors in fodder crops in Papua New Guinea

- Climate-smart insect-based feed development
- Development of suitable diets for weaner piglets
- Smallholder aquaculture development in Papua New Guinea

Research Focus Area – 3: Agricultural Economics

- Economic efficiency of small-scale rice farming
- Technical efficiency of smallholder coffee farming
- Resource-use efficiency among small-scale peanut farmers
- Economic analysis of small-scale insect farming for waste management

Research Focus Area – 4: Agricultural Extension and Rural Development

- Evaluation of extension approaches in Papua New Guinea and their effectiveness in improving rural livelihoods
- Challenges and opportunities in retaining youth in agriculture in Papua New Guinea
- Analysis of existing farming systems across regions of Papua New Guinea and their scope for improvement
- Assessment of household food security in peri-urban settlements
- Livelihood analysis of settlers in peri-urban communities
- Returns on investment in higher education, extension, and agricultural innovation
- Entrepreneurship development among rural communities
- Role of women in agriculture for enhancing food security
- Diffusion and adoption of agricultural innovations in rural communities

Research Focus Area – 5: Post-Harvest Technology

- Assessment of the current status of mechanization in Papua New Guinea and its impact on rural livelihoods and the environment
- Development of post-harvest technologies and management systems for horticultural crops in Papua New Guinea
- Investigation of intermittent microwave drying and its effects on nutritional, physicochemical, and phytochemical properties
- Evaluation of storage techniques and their effects on the nutritional and phytochemical quality of dried food products

Staff Profiles

Name	Designation	Research Expertise and Interests
Dr. Peter Manus	Professor & Head of School	Agriculture Economics, Agribusiness Management
Dr, Macquin Maino	Professor	Plant pathology, Nematology, Biocontrol Agents, Plant Physiology
Dr. Gariba Danbaro	Professor	Livestock Breeding, Animal Management Systems, Research Methods
Dr. Tom Okpul	Professor	Plant Breeding & Genetics, Biotechnology, Tissue Culture
Dr. Rajashekhar Rao BK	Professor	Soil Science, Soil Quality, Soil Fertility, Soil Pollution, Agricultural Chemistry
Dr. Veronica Bue	Associate Professor	Agricultural Extension, Women in Agriculture, Rural Sociology

Dr. Jayaprakash	Associate Professor	Veterinary Science, Animal Nutrition, Animal Health and Diseases
Dr. Gwendolyn Ban	Senior Lecturer	Plant Pathology, Bio Control Agents
Dr. Ronnie Dotaona	Senior Lecturer	Integrated Pest Management, Biocontrol Agents, Ecosystem services
Dr. Janet Pandi	Senior Lecturer	Animal Nutrition, Feed and Nutrition of Chickens in Smallholder Farming Systems.
Dr. Frank Vidinamo	Senior Lecturer	Post-Harvest Technology, Food Science, Drying Technology, Farm Machinery, Agriculture Field Engineering, Soil Compaction
Dr. Anayochukwu Victor Eze	Lecturer II	Agribusiness, Climate Change Adaptation, Rural Entrepreneurial Development
Mr. Nick Kewa	Lecturer II	Agribusiness, Climate Change mitigation
Mr. William Nano	Lecturer II	Agricultural Extension, Animal Nutrition, Aquaculture, On-Farm Trainings
Dr. Spencer Poloma	Lecturer II	Crop Physiology, grain crops, horticultural crops, root-rhizosphere fungal interactions
Ms. Betty Tiko	Lecturer II	Agricultural Extension, Rural Sociology, Social Research Methods
Mr. Kayman Kiwa	Senior Technical Officer	Agricultural Economics
Ms. Tabitha Parau	Senior Technical Officer	Agricultural Extension, Women in Agriculture

Undergraduate Student Projects

Details of supervised student (BSAG/3) research are given below.

Student name	Project Title	Supervisor/s
Elma Camillus	*Extraction of Meloidogyne Eggs from Plant Roots*	Dr. Ban
Georgina Roy	*Identification of Trichoderma spp. Using Molecular Characterization*	Dr. Ban
Adasha Smacker	*Identification of Meloidogyne spp. Using Molecular Characterization*	Dr. Ban
Foxcy Kapio	*Evaluation of SPISARD's Bulb Onion Project in Umisisiang Village, Markham District*	Dr. Bue Ms. Parau
Bradley Kenatsi	*Evaluation of SPISARD's Bulb Onion Project in Ragidumpiat Village, Markham District*	Dr. Bue Ms. Parau
Moses Nimai	*Evaluation of SPISARD's Bulb Onion Project in Marayai Village, Markham District*	Dr. Bue Ms. Parau
Ishmael Ambalis	*Life cycle studies of Oribius weevils in PNG lowlands*	Dr. Dotaona
Mevis Havauli	*Response of budded hybrid cacao seedlings to Beauveria fungus inoculation*	Dr. Dotaona
Bill Lelena	*Incidence of fall armyworm (Spodoptera frugiperda) on two CIMMYT maize hybrids*	Dr. Dotaona
Merishal Peter	*Growth of Entomopathogenic Fungus Beauveria different solid substrates*	Dr. Dotaona
Tilda K Gigil	*Exploring Small-holder Farmer's Utilization of Innovations for Fresh Vegetables Marketing in Eastern Highlands Province*	Dr. Eze
Nelson Kitao	*Profitability Analysis and Perception of Smallholder Fish Farmers Regarding the Growth Performance of Tilapia Fish*	Dr. Eze

	Fed with Commercially and Locally Sourced Feeds in the Western Highlands	
Otti Charles Danny	*Assessing the Gross Margin Analysis of Pig Production at Unitech Farm*	Mr. Kiwa Prof. Manus
Damien Feka	*Assessing the Gross Margin Analysis of Layer Production at Unitech Farm*	Mr. Kiwa Prof. Manus
Jackson Kundi	*Assessing the Gross Margin Analysis of Broiler Production at Unitech Farm*	Mr. Kiwa Prof. Manus
Olivia Bunena	*Screening of NARI Taro Lines for Incidence of Viruses*	Prof. Maino
Leandra Henson	*Investigating an Unknown Disease Affecting Noni Tree*	Prof. Maino
Annie Kuman	*Disease Incidence in Cacao*	Prof. Maino
Stanford Dupi	*Investigating the Effects of Organic Matter of High Carbon on Rooting and Tuber Formation of Winged Bean*	Dr. Michael
Eunice Huas	*Investigating the Effects of Organic Matter (Manure) on Selected Soil Properties Under Winged Bean*	Dr. Michael
Peter Channel Nanau	*Investigating the Combined Effects of Organic Matter of High Carbon and Nitrogen on Rooting and Tuber Formation of Winged Bean*	Dr. Michael
Valentine Dipon	*Trichoderma-Treated Cocoa Pod Husk Meal as Feed for Tilapia*	Mr. Nano
Jordan Kambian	*Trichoderma spp. Associated with Cocoa Plantations and their Potential for Plant Fiber Degradation*	Mr. Nano
Lucy Orapi	*Assessing the Different Levels of Rice Bran and Cocoa Pod Meal in Tilapia Feed*	Mr. Nano
Serah Awateng	*Rice Callus Regeneration and Transformation*	Prof. Okpul
Leonard Bariamu	*Charaterization of the PNG Cocoa Board Elite Cocoa Lines*	Prof. Okpul
Luana Dobunaba	*Establishing Tetraploid Watermelon Population for Seedless Fruit Production*	Prof. Okpul
Joshua Inayo	*Effects of Various Dosage of Cesium 137 on Taro Seedlings*	Prof. Okpul
Kerry Okpul	*Evaluation and Genetic Analysis of a Novel Interspecific Kangong × Sweet Potato Hybrid*	Prof. Okpul
Davida Cain	*Production of Black Soldier Fly for High Protein Feed for Broiler Chicken Using Wastes from, Unitech Mess*	Dr. Pandi
Pera Kuringi	*Surveying of Broiler Chicken Farmers in Goroka Urban Market*	Dr. Pandi
Victor Omot	*Black Soldier Fly Larva Production from Rice Byproducts as a Source of Protein for feed*	Dr. Pandi
Draby Ronny	*Farmers Attitude on How They Feed Their Broilers*	Dr. Pandi
Lynnette Tinah	*Survey of Broiler Chicken Farmers in the Lae Urban Market (closer to the feed mill) on Their Feeding Regimes in Raising Broiler Chickens*	Dr. Pandi
Emmanuel Balbal	*Effects of AMF on Theobroma Cacao Seedling Growth by Seed Soaking*	Dr. Poloma
Charlie Bonny	*Effects of AMF on Elaeis gunensis Seedling Growth by Top Dressing*	Dr. Poloma
Hans Harry	*Effect of Arbuscular Mycorrhizal Fungi on Theobroma cacao (Cocoa) Seedling Growth by Top Dressing*	Dr. Poloma
Inapero Loke	*Effects of AMF on Oryza sativa Seedling Growth by Seed Soaking*	Dr. Poloma
Tamily Tivus	*Effects of AMF on Oryza sativa Seedling Growth by Top Dressing*	Dr. Poloma

Michelle Aglua	*Potential of Neem Leaf Powder as a Nitrification Inhibitor*	Prof. Rao
Senen Andrew	*Effect of Waste Carton Box Mulching on Some Biochemical Properties of the Soil*	Prof. Rao
Nul Yomil	*Characterization on Waste Carton Boxes for Metal and Nutrient Concentration*	Prof. Rao
Willie Ariti	*Effect of Intermittent Microwave Drying Condition on the Nutrients and Physical Properties of Irish Potato*	Dr. Vidinamo

Postgraduate Student Projects

The faculty members of the school take part in mentoring higher degree candidates from sister Schools of the University.

Student name	Program	Project Title	Supervisor/s
Paula Kaupa	PhD	*Green Manure Integration as an INM Option in Sweet Potato: Effects on Soil Properties, Crop Nutrition and Productivity*	Prof. Rao
Sinafa Robby	PhD	*Characterization of Leptospira spp (Bacteria) in Cattle Population in the Morobe Province*	Prof. Maino
Lucy Maino	PhD	*Impacts of Integrated Development Approaches on the Livelihoods of Rural People: A Case Study in the Oro Province of Papua New Guinea*	Dr. Bue
Betty Tiko	PhD	*Gender Differences in knowledge, Perceptions, Attitudes and Skills of PNG Coffee Players in the e-Commerce Space*	Dr. Eze Dr. Bue
Michael Gaoma	PhD	*Cultural Intelligence and Transitional Physics Education in Papua New Guinea*	Prof. Maino (Co-supervisor)
William Nano	PhD	*Application of Enzyme-Treated Cocoa Pod Husks Meal as Fish Feed and its Potential in Aquaculture Farming Systems*	Dr. Pandi Dr. Poloma
Eko Maiguo	PhD	*Investigating the Exotic Trees and Their Agricultural Land-Use Significance in the Morobe Province, Papua New Guinea*	Prof. Maino Prof. Okpul
Timothy Bafiec	PhD	*Soil Quality Assessment and Responses of Zinc (Zn) to Maize Production in Markham Valley*	Prof. Rao
Nick Kewa	PhD	*Value Chain Analysis of Taro: The Case of Marhkam District, Morobe Province, Papua New Guinea*	Prof. Manus Prof. Okpul
Gure'ahafo Tumae	PhD	*Efficacy of Beauveria (Bals. Criv.) (Hypocreales: Codycipitaceae) Isolates from Elevational Gradients on Coffee Berry Borer (CBB), Hypothenemus hampei (Ferrari) in Papua New Guinea.*	Dr. Dotaona Prof. Okpul
Denano Sogoing	PhD	*Ecological Risk Assessment of Markham River and its Tributaries: A Case Study in Relation to Heavy Metals Contamination and Phyto-remediation*	Prof. Okpul (Co-supervisor)
Benson Mirou	PhD	*Development of e-crop Disease App for Farmers in Papua New Guinea*	Prof. Maino (Co-supervisor)
Peter Poi Aiyon	MPhil	*Presence of Races of Root-knot Nematode, Meloidogyne spp. in Papua New Guinea*	Prof. Maino

Jonah Anton	MPhil	*Exploring the Diversity of Marita (Pandanus conoideus) in Various Agro-Ecological Zone in Papua New Guinea Based on its Morphological Characteristics and Physiochemical Composition*	Dr. Michael
Naomi Gomuna	MPhil	*Comparative Analysis of Food Safety and Phytosanitary Measures for Importing PNG Taro into Australia, New Zealand, Japan and USA*	Prof. Okpul
Pauline Johne	MPhil	*Uncovering Environmental Risk of Metal Contamination in Food Gardens of Lae's Peri Urban Areas, Papua New Guinea*	Prof. Rao
Dominic Kia	MPhil	*Investigating the Effects of Cclimate Change on Food Crops Distribution and Agroclimatic Conditions Along an Altitudinal Gradient Kabwum District in Morobe Province, Papua New Guinea*	Dr. Michael
Obert Lou	MPhil	*Assessment of Live Weight Gains, Feed Intake and Feed Digestibility for Goats fed Elephant Grass (Pennisetum purpureum), Mixed with Leucaena leucocephala in Papua New Guinea*	Prof. Danbaro
Timothy Poy	MPhil	*Evaluation of Indigenous Clay Materials for Nickel Decontamination Potential*	Prof. Rao
Peilyn Willie	MPhil	*Estimation of Apparent Metabolizable Energy and Growth Performance of Broiler Chickens Fed Sorghum-Based Diets*	Prof. Danbaro
Samson Wongi	MPhil	*Costs-Benefits for Small Holder Cattle Farmers in Ungai Bena District, Eastern Highlands Province*	Prof. Manus
Natanya Alfred	MSc	*Investigating Improved Agronomic Production Practices on Soil Fertility and Yield of Winged Beans under Humid Lowland in Papua New Guinea*	Dr. Michael
Godfrey Hannett	MSc	*Agro-morphological characterization of the Galip Nut (Canarium indicum) Population Maintained at the NARI-Kerevat Arboretum, East New Britain Province*	Prof. Okpul
Stanley Hetto	MSc	*Dwarf Mango Development using Advanced Grafting and Hormonal Techniques*	Dr. Poloma
Veronica Hombande	MSc	*The Roles of Organic Matter of Varying Nutrients Contents on the Soil Fertility and Corn Yield under Humid Lowland Tropical Agroclimatic Conditions in Papua New Guinea*	Dr. Michael
Napolen Kandi	MSc	*Effects of Arbuscular Mycorrhiza Fungi on Upland Rice Growth and Yield Under Field Conditions*	Dr. Poloma
Peter Kerowane	MSc	*Value Chain Analysis of Bulb Onion in Gembogl, Simbu Province, Papua New Guinea*	Prof. Manus
Joshua Laino	MSc	*Agronomic Studies on Causes of Lodging in Rice (var. Trukai 12) and Alleviation Strategies Under Field Conditions*	Dr. Poloma

Jerry Marigita	MSc	*Study on the Prevalence of Bovine Brucellosis in Cattle and Pigs in Milne Bay Province*	Dr. Jayaprakash
Warendo Mark	MSc	*Investigating Drought Tolerance amongst Promising Dasheen and Eddoe Taro Varieties from Papua New Guinea*	Prof. Okpul
Raylin Puring	MSc	*Evaluation of Reciprocal Progeny Population of Two Corn Varieties*	Prof. Okpul
Job Sam	MSc	*Insecticidal Activity of Biotoxin Extracts from Native Entomopathogenic-Associated Bacterium*	Prof. Maino
Jeff Tanakae	MSc	*Potential of Vetiver Grass in Phytoremediation of Some Toxic Heavy Metals in Soil*	Prof. Rao
Lisahpo Wawah	MSc	*Evaluating the Ploidy Level and Drought Tolerance of Dasheen×Eddoe Taro Hybrids*	Prof Okpul
Germaine Timan	MSc	*Black Soldier Fly Larvae (Hermetia illucens) to as a Gut Modulator and Parasite Control Strategy in Young Pigs (Sus domesticus) Reared Under Semi-Intensive Systems in Papua New Guinea*	Dr Pandi

Externally Funded Staff Research and Development Projects

- Bue, V., et al. (2025). Developing an inclusive co-design process for strengthening food security in Western Province, Papua New Guinea (ACIAR Project No. SSS/2023/134). Project Leader: Dr Ann Hill. Collaborating institution: University of Canberra. ACIAR Research Program Manager: Dr Todd Sanderson.
- Danbaro, G., & Pandi, J. (2025). Pacific Chicken Genetic Gains Project (ACIAR Small Research Activity No. LS/2024/128). Ongoing project.
- Manus, P. (2025). Technical efficiency of rice farming: A comparative analysis across provinces in Papua New Guinea. Funded by Trukai Agro Industries (Research and Development).
- Michael, P., Rao, R. B. K., et al. (2024). Better soil and land information for improving Papua New Guinea's agricultural production and integrated land use planning: Building a revitalized PNG Resource Information System (PNGRIS2) (ACIAR Project No. SLAM/2019/106). A four-year project. Key outcomes include land-use information system revitalization and capacity building. Collaborators: CSIRO (Australia), Coffee Industry Corporation (CIC), GrowPNG, National Agricultural Research Institute (NARI), and National Department of Agriculture and Livestock (NDAL).
- Okpul, T., et al. (2024–2025). Trukai partnership: Research and development project (PGK 200,000). Focus on research and capacity building.
- Okpul, T., et al. (2025). Taro improvement for drought tolerance: Research and development project funded by ACIAR in collaboration with the University of Queensland (Prof. I. Godwin).
- Pandi, J., et al. (2025). Holistic training, baseline surveys, and partnership development for Black Soldier Fly (BSF) farming in Papua New Guinea (ACIAR Small Research Award No. LS/2024/144; PGK 150,000). This project is expected to scale into a larger program. Key outputs include capacity building, BSF research, rearing facility development, and product development. Collaboration between PNGUoT, NARI, and ACIAR (Dr A. Okello).

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Bue, V.	Team Member	*Asia Pacific Viewpoint*	Wiley, Australia	2025
Rao, R.B.K.	Guest Editor	*Journal of Plant Nutrition and Soil Science*	Wiley- VCH GmbH, Weinheim	2025-2027
Rao, R.B.K.	Editor	*Interdisciplinary Journal of PNGUOT*	PNGUoT	2025
Rao, R.B.K.	Editorial Board Member	*Agricultural Science Digest*	ARCC Publications India	2025
Rao, R.B.K.	Editorial Board Member	*Melanesian Journal of Geomatics and Property Studies*	PNGUoT	2025
Rao, R,B.K	Reviewers	Several Scopus/ WoS indexed papers	Elsevier, T&F, Springer, Wiley etc.	2025

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
School of Agriculture	3-year membership	ACDA	Australia	2025
Faculty members of the school	5-year	APAARI	Thailand	2025
Bue, V.	2 years	Asia Pacific Viewpoint	Australia	2025
Tiko, B.	1 year	Australasian Agricultural & Resource Economics Society	Australia	2025
Rao, R. B. K	Life member	Indian Society of Soil Science	India	2025
Rao, R. B. K	Annual Member	Indian Society of Soil and Water Conservationists	India	2025

Seminars/Workshops/Symposium/Conferences Participated/Organized

Bue, V. (2025, July 30–August 2). *4th International Conference on Governance and Development (ICGD4)* [Conference attendance]. Bangkok, Thailand. ACIAR.

Bue, V. (2025, November 26–December 2). *Research capacity building workshop for female researchers: Strongim Research Capacity Blong Ol Meri (SRKBOM)* [Workshop attendance]. Lae International Hotel, Papua New Guinea. APEC Study Center, RMIT University.

Bue, V. (2025, October 13–17). *Competitive research proposal writing for national and international grants* [Workshop attendance]. Huon Gulf Motel, Lae, Papua New Guinea. Papua New Guinea University of Technology.

Dotaona, R. (2025, April 25–May 25). *Black soldier fly farming and value chain development for improved food security, livelihoods, and climate resilience* [Training]. Nairobi, Kenya. icipe, InsectiPro Ltd, Zehunger Solutions, & ACIAR.

Dotaona, R. (2025, October 6–12). *Plantwise diagnostics training* [Training]. AQ Hall, Bubia, NARI, Papua New Guinea. CABI.

Dotaona, R. (2025, October 13–17). *Competitive research proposal writing for national and international grants* [Workshop attendance]. Huon Gulf Motel, Lae, Papua New Guinea. Papua New Guinea University of Technology.

Eze, A. V. (2025, October 13–17). *Competitive research proposal writing for national and international grants* [Workshop facilitator]. Huon Gulf Motel, Lae, Papua New Guinea. Papua New Guinea University of Technology.

Kewa, N., Manus, P., Okpul, T., & Poloma, S. (2025, January 13–30). *Trukai SmartFarmer training (training of approximately 150 farmers nationwide)* [Training]. School of Agriculture, Papua New Guinea University of Technology. Trukai Agro Industries Ltd.

Pandi, J. (2025, March 11–April 11). *Black soldier fly farming and value chain development for improved food security, livelihoods, and climate resilience* [Training]. Nairobi, Kenya. icipe, InsectiPro Ltd, Zehunger Solutions, & ACIAR.

Pandi, J. (2025, October 12). *Open Data Kit (ODK) training for poultry household survey* [Training]. Papua New Guinea University of Technology, Lae, Papua New Guinea. International Livestock Research Institute (ILRI) & ACIAR.

Tiko, B. (2024, April 10–11). *International conference on agricultural software and information management (ICASM-24)* [Conference attendance]. Sydney, Australia. Institute for Scientific and Engineering Research (ISER).

Tiko, B. (2025, November 26–December 2). *Research capacity building workshop for female researchers: Strongim Research Capacity Blong Ol Meri (SRKBOM)* [Workshop attendance]. Lae International Hotel, Papua New Guinea. APEC Study Center, RMIT University.

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
Ramu Nico	PNG	Research and Development	16 June 2025	2025-2026	Signing of the MoU,PQK50,000 Research funds
Chongqing Normal University	China	Develop Rice Research Centre	September 2025	2025-2028	Signing of the MoU
National Nanfan Research (Sanya), Chinese Academy of Agricultural Sciences	China	Wild Rice Research and Development	September 2025	2025-2028	Signing of the MoU

Research Outputs

Journal Articles

Auguiom, D., Maiga, G., & Dotaona, R. (2025). How farmers manage taro beetle in the perhumid lowlands of Papua New Guinea. *Interdisciplinary Journal of Papua New Guinea University of Technology*, *2*(2). https://doi.org/10.63900/jp8pd668

Danbaro, G., Ssemugenyi, F., & Okpul, T. (2025). Predictive validity of the special tertiary admission test in Papua New Guinea. *International Journal of Education and Practice*, *13*(3), 1022–1031. https://doi.org/10.18488/61.v13i3.4356

Kaupa, P., & Rao, R. B. K. (2025). Biomass and nutrient accumulation potential of green manure species for integration in humid tropical subsistence food cropping systems of Papua New Guinea. *Indian Journal of Soil Conservation*, *53*(2), 142–149. https://doi.org/10.53550/ijscv53.12.197

Rao, R. B. K., & Akanda, S. (2025). Postgraduate education at Papua New Guinea University of Technology: A distinctive journey of achievements and national development. *International Journal of Papua New Guinea University of Technology*, *2*(2). https://doi.org/10.63900/zx73nw76

Robby, S., Iamba, K. S., Tringin, S., & Maino, K. (2025). Retrospective screening of cattle serum for leptospirosis in the Morobe Province of Papua New Guinea. *International Journal of Papua New Guinea University of Technology*, *2*(2). https://doi.org/10.63900/wptcxk78

Nake, S., Curry, G. N., Koczberski, G., Germis, E., Bue, V., Tilden, G. M., Koia, M., Pilen, L., & Ryan, S. (2025). Social, technical and institutional innovation: Oil palm smallholders' responses to rising land and income pressures in Papua New Guinea. *Cahiers Agricultures*, *34*, Article 24. https://doi.org/10.1015/cagri/2025025

Conference Presentations/Proceedings

Aipa, S., & Michael, P. (2025, October 1–3). *Assessing the importance of organic matter application in old cocoa plantation soils to manage soil fertility and yield responses under tropical lowland agroclimatic conditions*. PNG University of Technology Annual Postgraduate Seminar 2025, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Anis, S., Timi, D., Lebouvier, N., Maino, M., Bau, B., Wau, J., & Oelgemoeller, M. (2025, July 1–3). *Chemical and biological investigation of PNG Xanthostemon species of the Myrtaceae family* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Anton, J., Amben, S., Ahizo, J., & Michael, P. (2025, July 1–3). *A comparative assessment of marita (Pandanus conoideus) and its production challenges and opportunities for further research and development in Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Gomuna, N., & Okpul, T. (2025, July 1–3). *Assessment of Papua New Guinea frozen taro* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Hannett, G., Leonard, K., Wallace, H., & Okpul, T. (2025, July 1–3). *Analysis of genetic variation among galip nut (Canarium indicum) accessions from four islands of Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Kasa, L., & Michael, P. (2025, July 1–3). *Investigating the agricultural importance of piggery sludge under humid lowland tropical agroclimatic conditions in Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Kaupa, P., & Rao, R. B. K. (2025, July 1–3). *A review on the role of green manure in sustaining soil fertility and crop productivity in Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Maiguo, E., Maino, M., & Okpul, T. (2025, July 1–3). *Impact of exotic naturalized trees on landscapes in Papua New Guinea: The situation in Bulolo and Wau* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Perreira, F., Gaoma, M., & Maino, M. (2025, July 1–3). *Analysis of cultural intelligence in different regions of Papua New Guinea based on physics education* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Peter, T., & Michael, P. (2025, July 1–3). *Role of organic matter with varying nutrient content as amendments in composted mounds on sweet potato micronutrient accumulation* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Peter, T., & Michael, P. (2025, October 1–3). *Effects of legume-based organic matter on soil chemistry of composted mounds under sweet potato production in Papua New Guinea*. 3rd PNG Climate Summit, Hilton Hotel, Port Moresby, Papua New Guinea.

Robby, S., Tringin, S., Puana, I., Kapo, N., & Maino, M. (2025, July 1–3). *Animal health capacity building in Papua New Guinea: Strengthening animal and wildlife health systems through biosecurity, One Health, and cross-border collaboration* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Sui, S., & Michael, P. (2025, July 1–3). *Organic matter amendment of swidden fields to maximize sweet potato yield along an altitudinal gradient in Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Wawah, L., Warendo, M., Campbell, B., & Okpul, T. (2025, July 1–3). *Variations in ploidy levels among taro in Papua New Guinea* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Research Reports

Birhanu, M. Y., Danbaro, G., Mael, S. H., Samau, S., Pandi, J., Ahizo, J., Esatu, W., Vaiaso, N. V., Taungakava, F. V., Moses, K., Alemayehu, A., Dessie, T., & Diarra, S. (2025). *Poultry production and household livelihoods in Papua New Guinea, Samoa, and Vanuatu: A review of literature* (Research Report No. 126). International Livestock Research Institute. https://www.researchgate.net/publication/399046055_Poultry_production_and_household_livelihoods_in_Papua_New_Guinea_Samoa_and_Vanuatu_A_review_of_literature

Rao, R. B. K. (2025). *Papua New Guinea University of Technology Research Report 2024*. Papua New Guinea University of Technology. https://www.pnguot.ac.pg/wp-content/uploads/2025/06/Research-Report-2024-final_compressed.pdf

SCHOOL OF FORESTRY

Head of the School: Dr Cossey K. Yosi

Introduction

The School of Forestry (SoF) at the Papua New Guinea University of Technology (PNGUoT) has built a strong reputation for providing exceptional training in tropical forestry. Situated on the traditional lands of the Ahi people, the institution holds significant cultural importance. Students attending the Taraka (SoF), Bumbu (TFTC), or Bulolo (BUC) campuses can expect a consistent and comprehensive curriculum.The Timber and Forestry Training College (TFTC), which joined the School of Forestry in 2023, offers a two-year Diploma in Wood Science and Technology. Bulolo University College (BUC) offers a three-year Diploma in Forestry (DipFor) program and has expanded its offerings with a Bachelor of Forest Resource Management (BFRM) program, which started in 2023. The Taraka campus provides a four-year Bachelor of Science in Forestry (BScF) program and supports postgraduate studies (MPhil and PhD programs). In 2025, the school made significant progress in its benchmarking exercise with the University of Canterbury, New Zealand, establishing communication to meet benchmarking requirements for international accreditation of undergraduate programs. The school also strengthened research collaborations across the Asia-Pacific region, with active partnerships with CIFOR-ICRAF, IPB University (Indonesia), University of Melbourne (Australia), Harvard University (USA), and Western Sydney University (Australia).

Research Focus

The SoF has recognized the diverse value of Papua New Guinea's forests and has incorporated it into its academic and research programs. Achieving sustainable forestry in PNG requires an interdisciplinary approach that blends economic, social, environmental, and climate change aspects. To this end, SoF has developed a Research Development Plan and Postgraduate Study Program focusing on several research themes: Ecosystem and Environmental Services; Sustainable Forest Management; Forest Biology, Ecology, and Biodiversity; Forest (Health) Protection; Wildlife Management, Community-Driven Forest Conservation; The Role of Forests in Climate Change; Silviculture (including Reforestation and Plantation Management); Agroforestry, Social and Community Forestry, Multiple Land Use; Wood Science and Technology, Timber Products, and Industries/Utilization; Forest Engineering; Forest Policy, Economics, and Forest Product Marketing; Appropriate Technology; Remote Sensing and Geographic Information Systems; and Biomass Energy.
In the 2025 academic year, the SoF had 36 academic staff members responsible for delivering lectures and conducting research across the three campuses (Taraka, Bumbu, and Bulolo).

Staff Profiles

The following table presents academic staff at the Taraka (SoF), Bulolo (BUC) and Bumbu (TFTC) campuses, their positions and research interests:

Name	Designation	Research Expertise and Interests
A/Prof. Cossey K. Yosi	HoS and Associate Professor	Tropical Forests Dynamics; Natural Forests Management; Forest Policy, Law and Legality; REDD+; Forest Certification
Prof. Yusuf Sudo Hadi	Professor	Wood Science and Technology; Forest Management
Dr. Jimmy Moses	Lecturer 2, Deputy HoS & Research Coordinator	Entomology, Spatial Ecology, Macroecology, Data Science
Mr. Peter Edwin	Lecturer 2	Wood Science and Technology; Forest Management

Mr. Haron Jeremiah	Lecturer 2	Forest Economics and Marketing
Mr. Billy Bau (on study leave)	Lecturer 2, Deputy HOD & Curator - Herbarium	Plant Botany; Herbarium Curation; Plant Taxonomy; Botanical Collection
Mr. Eko Maiguo	Principal of BUC, Lecturer 2	Silviculture and Forest Management
Mr. Louis Veisami	Lecturer 1	Forest Mensuration and Inventory
Mr. Benson Gusamo	Lecturer 2	Wood Science and Technology, Forest Products, Bio-energy, Forest Protection
Mr. Gibson Sosanika	Lecturer 1	Botany, Forest Ecology, Forest Conservation, Ecosystem restoration
Mr. Leroy Moripi	Lecturer 1, AQAT Coordinator	Soils and Soil Carbon, Climate Science and Climate Change
Mr. Bazakie Baput	Lecturer 1	Community/Social Forestry; Forest Policy; Agroforestry and Forest Soils
Mr. Olo Gebia	Lecturer 1, A/Director BUC	Forest Ecology and Plant Biology; Forest Biodiversity
Mr. Leonard Wana	Lecturer 1, Examination Coordinator	Forest Inventory and Geographic Information Systems
Mr. Morean Simeon	Director	Cabinet Making and Joinery
Mrs. Moira Spairong	Acting Deputy Director, Principal Trade Instructor	Wood Preservation and Timber Grading
Mr. Mathew Wundumani	Principal Trade Instructor	Sawmilling
Mr. Ravu Iru	Senior Trade Instructor	Wood Machining
Mr. Jimmy Osikore	Principal Trade Instructor	Timber Harvesting and Log Scaling
Mr. Steven Komut	Senior Trade Instructor	Silviculture and Wood Science and Technology
Mr. Andrew Kassa	Principal Trade Instructor	Wood Machining
Mr. Lus Pora	Principal Trade Instructor	Cabinet Making and Joinery
Mr. Eroy Kotipe	Senior Trade Instructor	Wood Science and Technology
Mr. Taison Apurel	Senior Trade Instructor	Wood Machining
Mr. Gerald Kambuou	Principal Trade Instructor	Saw Doctoring
Mr. Engelbert Spairong	Senior Trade Instructor	Saw Doctoring
Mr. Robertson Selan	Senior Trade Instructor	Cabinet Making and Joinery
Mr. Michael Edney	Senior Trade Instructor	Sawmilling
Mr. Mathew Kore	Senior Trade Instructor	Sawmilling
Mr. Daniel Marika	Principal Trade Instructor	Sustainable small-scale sawmilling
Ms. Galie Nanong	Senior Trade Instructor	Sustainable small-scale sawmilling
Mr. Ashley Yoseah	Trade Instructor	Cabinet Making and Joinery
Mr. Vincent Aron	Trade Instructor	Sawmilling
Mr. Pewali Angopa	Part-time Teacher	Computer Science
Mr. Elizah Kaut	Part-time Teacher	Wood Science and Technology
Ms. Iaupa Hepe	Part-time Teacher	Silviculture and Forest Management

Undergraduate Student Projects

The undergraduate research projects conducted in 2025 spanned a diverse range of topics. SoF hosted the FR421 Final Year Seminar on 17 October 2025 utilizing two classrooms, featuring 42 student project presentations.

Student name	Program	Project Title	Supervisor/s
Andanius Ruben	BScF4	*Developing and Estimating Above Ground Biomass for Araucaria cunninghamii at PNGFA in Bulolo Pine Plantation using Non-Destructive Method*	Mr. Louis Veisami, Mr. Samson Aguadi

Ekaro Masawa	BScF4	*Assessment of Soil pH, Organic Matter Content, and Soil Management Strategies for Reforestation Areas in Bulolo Forest Plantation, Morobe Province, PNG*	Mr. Bazakie Baput, Dr. Diati Zure
Jenkihau Maxtone	BScF4	*Evaluating Stakeholder Perspectives on Timber Legality Standard Compliance in the Forestry Sector: A Case Study of Bulolo Forest Plantation and PNG Forest Products Operations*	Mr. Bazakie Baput, Mr. Koniel Alis
Mandokoi Lester	BScF4	*Assessing the Impact of Logging Equipment on Soil Compaction and Forest Regeneration in Bulolo Logged over Sites*	Mr. Leroy Moripi, Mr. Olo Gebia, Mr. Charles Feriwok
Penunu Smith	BScF4	*Comparing Microclimate Benefits of Native versus Exotic Tree Species in Lae Urban Spaces*	Mr. Bazakie Baput
Timothy Georgina	BScF4	*Assessment of Wood Wastes Generated from Timber Processing Industries as Potential for Biochar Production in Morobe Province, PNG*	Mr. Benson Gusamo, Dr. Jimmy Moses
Kurangik Daniella	BScF4	*Examining the Contribution of Forest Floor Litter to Soil Organic Carbon Accumulation in Tropical Forest Ecosystems*	Mr. Leroy Moripi, Mr. Maman Tavune
Sipa Andy	BScF4	*Effects of Open and Closed Canopy on Undergrowth Diversity Across Elevation Gradients*	Mr. Olo Gebia, Dr. Jimmy Moses
Wrondimi Evonne	BScF4	*Impacts of Temperature on Soil Health and Its Subsequent Effect on Forest Productivity and Carbon Storage on Alluvial Soils*	Mr. Leroy Moripi, Mr. Patrick Nimiago
Winston Jezreel	BScF4	*Investigating the Impact of Invasive Species (Piper aduncum) on Native Forest Ecosystems in Local Woodlands in Morobe Province, Bulolo District*	Mr. Gibson Sosanika
Filer Isobel	BScF4	*Diversity and Infestation Patterns of Invasive Australian Giant Termites (Mastotermes darwiniensis) in Lae National Botanical Gardens*	Dr. Jimmy Moses, Mr. Peniel Lamei
Fokopa Roy	BScF4	*Identification and Characterization of Insect Herbivores on Pometia pinnata and Calophyllum sp. Along an Elevational Gradient in PNG*	Dr. Jimmy Moses
Emanuel Ezekiel	BScF4	*Assessing Mechanical Properties (Compression, Janka Hardness & Shear) of Glulam Composed of Plantation-Grown Araucaria sp.*	Mr. Benson Gusamo
Joseph Douglas	BScF4	*Detecting Forest Disturbance Patterns in PNG Tropical Lowland Forest Using Three-Year Satellite Time Series Analysis (2020-2022)*	Dr. Jimmy Moses
Liripi Briten	BScF4	*Estimating Aboveground Biomass and Carbon Stock of the National Botanical Garden Using GIS and Remote Sensing Techniques*	Mr. Leonard Wana, Ms. Agnes Sumareke
Lucas Finley	BScF4	*Conversion or Utilization of Araucaria cunninghamii and Araucaria hunsteinii Residues to Biochar for Bioenergy Source*	Mr. Koniel Alis, Mr. Benson Gusamo
Magela Urai	BScF4	*Rapid Assessment of Soil Organic Matter and pH Changes Under Contrasting Agroforestry System Components: A Comparative Study*	Mr. Leroy Moripi, Mr. Bazakie Baput

Waisi Samuel	BScF4	*Evaluating Local Plant-based Dyes for Enhancing the Aesthetic Quality and Anti-termite Efficiency of Pale Wood Species in PNG*	Mr. Benson Gusamo
Awaku Melsie	BScF4	*Exploring the Feasibility of Burlap Sack Rehabilitation in PNGFRI Botanical Garden*	Mr. Gibson Sosanika
Bobby Lenisha	BScF4	*Pometia pinnata (Taun) Wildings Recovery and Planting in the Field to Assess Its Survival*	Mr. Haron Jeremiah
Kawona Adelyn	BScF4	*Assessing the Anti-Microbial Properties of Piper betle L. for Future Market Opportunities in PNG (NTFP Development)*	Mr. Haron Jeremiah, Mr. Jason Wau
Mirinu Maryanne	BScF4	*Investigation of Foxtail and other Defects in Pinus caribaea Plantations in Bulolo*	Mr. Haron Jeremiah, Mr. Anton Lata
Pena Bonalizah	BScF4	*Evaluating the Impacts of Pollinator Diversity Across Different Forest Types in Lae, Morobe Province*	Mr. Gibson Sosanika, Dr. Jimmy Moses
Toom Samantha	BScF4	*Assessing the Impact of Urban Green Spaces on Mental Health and Community Well-being in Lae, Morobe Province*	Mr. Leroy Moripi, Dr. Jimmy Moses
Aikebuse Jordan	BScF4	*Assessing the Potential of Biomass Wastes Generated from Municipal Food Markets for Bio-products and Circular Economy*	Mr. Benson Gusamo
Ten Mona Lisa	BScF4	*Estimating Decay Rates of Coarse Woody Debris (CWD) of Araucaria hunsteinii Grown in Bulolo Plantations using Chrono-Sequencing*	Mr. Haron Jeremiah
Urata Walter	BScF4	*Estimating the Decay Rates of Coarse Wood Debris (CWD) in Klinki Pine Using Chrono-sequencing: A Tool for Monitoring Plantation Health and Carbon Management Practices*	Mr. Haron Jeremiah
Veisami Vei	BScF4	*Forest Inventory and Volume Comparison of Araucaria Species in Even-Aged Plots in Morobe Province, PNG*	Dr. Jimmy Moses
Nuhunge Solomon	BScF4	*Assessment of Biochar's Carbon Sequestration Potential from Forestry Residues in PNG: A Desktop Study*	Mr. Leroy Moripi
Yalim Flynn	BScF4	*Soil Assessment for Erosion Control Along the Yalu River*	Dr. Jimmy Moses, Mr. Leroy Moripi
Thomas Desmond	BScF4	*Estimation of Fine Wood Debris (FWD) Quantity and Decay Rates Between Three Age Classes of Hoop Pine at Bulolo National Forest Service Plantation*	Mr. Haron Jeremiah
Mickdu Shadrick	BScF4	*Assessment of Aquatic Plants for Contaminant Reduction and Biochemical Oxygen Demand (BOD) Enhancement in Sewage Ponds at PNG University of Technology*	Mr. Billy Bau, Dr. Jimmy Moses
Gibere Wilton	BScF4	*An Assessment of Carbon Cycling in Soils Across Different Landscapes in Morobe Province, PNG*	Mr. Leroy Moripi
Lip Issack	BScF4	*Comparing Forest Litter and Coarse Woody Debris (CWD) Biomass Across Forest Types in Lae, Morobe Province, PNG*	Mr. Leroy Moripi

Sipa Eddie	BScF4	*The Role of Mycorrhizal Fungi in Carbon Sequestration and Tree Growth in Secondary Forest Ecosystem*	Mr. Gibson Sosanika
Tirbuak Alison	BScF4	*Evaluating the Effects of Climate Change on Tree Diversity and Carbon Storage in Lae Botanic Gardens*	Mr. Leroy Moripi, Mr. Billy Bau
Mikasimo Huvi	BScF4	*Assessing Volume and Potential Utilization of Fallen Trees in Lapegu Plantation*	Mr. Louis Veisami, Dr. Jimmy Moses
Tim Damien	BScF4	*Tree Species Richness and Species Diversity at PNG Forest Research Institute's Botanical Garden and PNG Unitech's Arboretum: A Case Study for Biodiversity Ex-Situ Conservation in PNG*	Mr. Olo Gebia, Mr. Billy Bau
Misiel Grace	BScF4	*A Meta-analysis of the Effectiveness of REDD+ Programs in Reducing Forest Carbon Emissions in the Pacific Region*	Dr. Jimmy Moses, Mr. Leroy Moripi
Wingti Ottomaf	BScF4	*Above Ground Biomass (AGB) and Carbon Storage in Natural Forests: A Comparison Between Primary and Secondary Forests in Morobe Province, PNG*	Mr. Leroy Moripi
Ketefa Gideon	BScF4	*Gradient Precipitation Effects on Decomposition across Habitat Types in Papua New Guinea's Tropical Forests*	Dr. Jimmy Moses, Mr. Olo Gebia
Mentai Aron	BScF4	*GIS-Based Coffee Farm Mapping and Carbon Stock Estimation via Plot Inventories*	Mr. Leonard Wana

Postgraduate Student Projects

SoF has achieved significant progress in postgraduate research, with 13 active postgraduate students in 2025, comprising 4 PhD and 9 MPhil candidates.

Student name	**Program**	**Project Title**	**Supervisor/s**
Mr. Hayden Wagia	PhD in Forestry	*The Ecology of Tropical Rainforest Trees in New Guinea: Tree Species Mortality, Diversity, Dominance and Composition*	A/Prof. Cossey Yosi
Mr. Philip Topaiman Ouyoumb	PhD in Forestry	*A Comparative Analysis of Different Silvicultural Treatments Over 16 Years on Forest Recovery and Tree Species Regeneration in a Selectively Logged Over Lower Montane Forest in PNG: Implications for Timber Management, Carbon Storage and Conservation Values*	A/Prof. Cossey Yosi
Mr. Mondo Kamar	PhD in Forestry	*Modelling Growth and Yield of Selected Plantation Tree Species in Papua New Guinea*	A/Prof. Cossey Yosi
Mr. Israel Penu	MPhil in Forestry	*Species Diversity and Aboveground Carbon Stock Assessment of a Mangrove Forest in Aluki in Morobe Province, Papua New Guinea*	A/Prof. Cossey Yosi
Ms. Ivy Kiele	MPhil in Forestry	*Impacts of the Root System of Selected PNG Tree Species on Soil Erosion and Maintenance of Essential Plant Growth Nutrients*	Prof. Yusuf S. Hadi; Mr. Haron Jeremiah

Ms. Christine Pokana	MPhil in Forestry	*Assessing the Abundance, Distribution and Ecological Interactions of Butterfly Communities and Aristolochia Host Plants along an Elevational Gradient in Papua New Guinea*	Dr. Jimmy Moses
Ms. Priscilla Menin	MPhil in Forestry	*Assessing the Socio-Economic Impact of Forestry Pine Plantations on Local Communities: A Case Study of the Manki Clan in Papua New Guinea*	Dr. Jimmy Moses
Mr. Steven Wilfred Komut	MPhil in Forestry	*Study on Physical-Mechanical Properties and Non-Destructive Test on Trema orientalis (L.) Blume from the Secondary Forest of Papua New Guinea.*	Prof. Yusuf S. Hadi; Mr. Benson Gusamo
Mr. Clifford Yaee	MPhil in Forestry	*Species Richness and Community Composition of Amphibians along a Rainforest Elevation Gradient in Papua New Guinea*	Dr. Jimmy Moses
Mr. Paul Marai	MPhil in Forestry	*Papua New Guinea's Woods Impregnated with Glycerine-Citric Acid, Alkaline Copper Quaternary (ACQ), and Imidacloprid Resistance to Subterranean Termite Attack*	Prof. Yusuf S. Hadi; Dr. Mahdi Mubarok (IPB); Mr. Billy Bau
Ms. Bethany Youfei	MPhil in Forestry	*Quantifying Species Richness and Abundance of Bees Along an Elevation Gradient in Papua New Guinea*	Dr. Jimmy Moses
Mr. Jeffery Kore	MPhil in Forestry	*Epiphytes Community Composition and Diversity in the Tropical Montane Forests of Papua New Guinea: Comparison Between Mt. Wilhelm and Sarawaged Range*	Dr. Jimmy Moses
Mr. Malcolm Suvi	MPhil in Forestry	*Mangrove Leaf-Litter Biomass Influences Soil Carbon Storage Across Mangrove Ecological Zones: A Case Study of Mangroves in East New Britain Province*	Dr. Jimmy Moses

Funded Staff Research and Development Projects

Project Title and Number	*Estimating CO_2 Sequestration from Permanent Sample Plots: An Investigation to Inform the Potential of Payment for Environmental Services (PES) for PNG Communities*
Funding Source	PNGUoT Internal
Project Duration	2022-ongoing
Funding Amount	Internal allocation
Project Team	A/Prof. Cossey Yosi (Principal Investigator)
Outputs, Outcomes and Key impacts	Ongoing data collection from permanent sample plots; contributing to national carbon accounting framework.
Project Title and Number	*Estimating Exploitation Factors Associated with Annual Allowable Cut (AAC) in Timber Concessions in PNG*
Funding Source	PNGUoT Research Fund
Project Duration	2024-ongoing

Funding Amount	Unitech Research Fund supported
Project Team	A/Prof. Cossey Yosi (Principal Investigator)
Outputs, Outcomes and Key impacts	Study ongoing data collection in progress to inform sustainable timber harvesting policies
Project Title and Number	*Seed Conservation of Trees in Papua New Guinea Tropical Rainforests*
Funding Source	PNGUoT Internal
Project Duration	2018-ongoing
Funding Amount	Internal allocation
Project Team	Mr. Gibson Sosanika (Principal Investigator)
Outputs, Outcomes and Key impacts	Online database established in 2018; continuous data collection and curation ongoing.
Project Title and Number	*Validating a Model Developed to Estimate Volume from the Weight of Klinkii Logs in Bulolo Pine Plantations*
Funding Source	PNGUoT Internal
Project Duration	2023-2025
Funding Amount	Internal allocation
Project Team	Mr. Louis Veisami and Mr. Eko Maiguo (Co-Investigators)
Outputs, Outcomes and Key impacts	Data analyzed; manuscript write-up in progress.
Project Title and Number	*Balsa (Ochroma pyramidale) Trial Plot and Seed Orchard at a Higher Elevation*
Funding Source	PNGUoT Internal
Project Duration	2024-2028
Funding Amount	Internal allocation
Project Team	Mr. Bazakie Baput (Principal Investigator)
Outputs, Outcomes and Key impacts	Permanent Sample Plot established July 2024; measurements ongoing until 2028.
Project Title and Number	*Performance of Polystyrene-Impregnated and CCA-Preserved Tropical Woods Against Subterranean Termites in PNG Field*
Funding Source	External (IPB University, Indonesia)
Project Duration	2023-2025
Funding Amount	IPB University funded
Project Team	Prof. Yusuf S. Hadi (Principal Investigator); A/Prof. Cossey Yosi; Mr. Paul Marai

Outputs, Outcomes and Key impacts	Published in Polymers journal (July 2025); keynote presentation at IPB University International Seminar (December 2025).
Project Title and Number	*Mechanical Properties of Glulam Composed from Plantation-grown Araucaria spp.*
Funding Source	External (PNG Forest Products Ltd.)
Project Duration	2024-ongoing
Funding Amount	Industry supported
Project Team	Mr. Benson Gusamo (Principal Investigator)
Outputs, Outcomes and Key impacts	Research ongoing; undergraduate student project (Ezekiel Emanuel) contributing to data collection.

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Associate Professor Dr Cossey Yosi	Editorial Board Member	*Interdisciplinary Journal of Papua New Guinea University of Technology*	PNGUoT	2024-2026

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
Associate Professor Dr Cossey Yosi	Member	Association of Foresters of Papua New Guinea (AFPNG)	Papua New Guinea	2025
Associate Professor Dr Cossey Yosi	Member	Commonwealth Forestry Association (CFA)	International	2025
Dr. Jimmy Moses	Member	Association for Tropical Biology and Conservation (ATBC)	International	2025
Dr. Jimmy Moses	Research Affiliate	New Guinea Binatang Research Center and Institute of Entomology, Biology Centre, Czech Academy of Sciences	Papua New Guinea and Czech Republic	2025
Prof. Yusuf Sudo Hadi	Founding Chairman	Indonesian Wood Research Society (IWoRS)	Indonesia	2025
Prof. Yusuf Sudo Hadi	Member	International Association of Wood Anatomists (IAWA)	International	2025
Prof. Yusuf Sudo Hadi	Member	Society of Wood Science and Technology (SWST)	USA	2025
Dr. Vidiro Gei	Member	Australasian Systematic Botany Society	Australia	2025

Seminars/Workshops/Symposium/Conference Organized/Participated

Edwin, P. (2025, March 14). *PhD confirmation seminar: Evaluation and confirmation of PhD project* [Seminar presentation]. International Seminar, University of Melbourne, Online.

Komut, S. (2025, April 22). *MPhil candidature confirmation seminar: Evaluation of research proposal and candidature* [Seminar presentation]. School of Forestry, Taraka Campus.

Kamar, M., & Topaiman, P. (2025, June 27). *PhD candidature confirmation seminar: Evaluation of research progress and candidature* [Seminar presentation]. School of Forestry, Taraka Campus.

Moses, J., Iru, R., Spairong, M., Morean, S., & Tsiritsi, C. (2025, June 30–July 4). *Basic data analysis: In-house workshop training* [Workshop]. TFTC Computer Lab, Bumbu Campus.

Moses, J., Toko, P., Redmon, C., Mogina, J., Novotny, V., & PhD students. (2025, July–August). *Introduction to statistical analysis using Jamovi and R* [Workshop]. New Guinea Binatang Research Center, Kokomo Conference Room.

Suvi, M. (2025, August 20). *MPhil candidature confirmation seminar: Evaluation of research proposal and candidature* [Seminar presentation]. School of Forestry, Taraka Campus.

Penu, I. (2025, October 2). *Annual MPhil seminar: Presentation of research findings* [Seminar presentation]. Faculty of Postgraduate Studies, Research & Innovation, RKLT Foyer.

BScF4 students. (2025, October 17). *FR421 final year research project II seminar: Final research findings presentations* [Seminar presentation]. School of Forestry, Taraka Campus.

Yosi, C. K. (2025, November 21–December 1). *Pacific research network collaboration* [Conference participation]. PIURN Summer Institute, University of the South Pacific, Suva, Fiji.

Hadi, Y. S. (2025, December 18). *Wood preservation and termite resistance: Polystyrene-impregnated woods* [Seminar presentation]. IPB University, Bogor, Indonesia.

Moripi, L. (2025, July 9). *GIS and remote sensing applications for forestry* [Training]. JICA/Hokkaido University, Sapporo, Japan.

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
University of Melbourne	Australia	Joint research on sustainable levels of timber harvesting in PNG	2023	2023-2026	ACIAR-ARSF funded study ongoing; collaborative data collection and analysis
CIFOR-ICRAF	International	Butterfly-host plant research and conservation in Managalas, Oro Province	2023	2023-2026	MPhil scholarship; fieldwork completed; thesis write-up ongoing
IPB University	Indonesia	PhD scholarship and wood science research collaboration	2025	2025-2028	Mr. Billy Bau commenced PhD studies; joint research on wood preservation
University of Canterbury	New Zealand	Benchmarking for international accreditation of forestry programs	2025	Ongoing	Communication established; benchmarking requirements being addressed for BScF, BFRM, Diploma programs

New Guinea Binatang Research Center (BRC)	PNG	EU-FCCB MPhil scholarship administration, research support	2025	Ongoing	MPhil students support, mentorship, capacity-building and research collaboration

Research Outputs

Journal Articles

Hadi, Y. S., Yosi, C., Marai, P., Mubarok, M., Abdillah, I. B., Pari, R., Pari, G., Syukur, A., Zaini, L. H., Hermawan, D., et al. (2025). Performance of polystyrene-impregnated and CCA-preserved tropical woods against subterranean termites in PNG field and treatment-induced color change. *Polymers, 17*(14), 1945. https://doi.org/10.3390/polym17141945

Conference Presentations/Proceedings

Hadi, Y. S. (2025, December). *Performance of polystyrene-impregnated and CCA-preserved tropical woods against subterranean termites in PNG field and treatment-induced color change* [Keynote address]. International Seminar, IPB University, Bogor, Indonesia.

Maiguo, E., Maino, M., & Okpul, T. (2025, July 1–3). *Impact of exotic naturalized trees on landscapes in Papua New Guinea: The situation in Bulolo and Wau* [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Yosi, C. K. (2025, November). *Pacific Islands Universities Research Network (PIURN) summer institute* [Conference participation]. University of the South Pacific, Suva, Fiji.

FACULTY OF SCIENCES

SCHOOL OF APPLIED PHYSICS

Head of the School: Dr. David Kolkoma

Introduction

The Bachelor of Science in Applied Physics with Electronics and Instrumentation (BSAP) and the Bachelor of Engineering in Biomedical Engineering (BEBE) are the two main programs offered by the School of Applied Physics. It also provides service teaching to other educational institutions. Strong quality is demonstrated by the BSAP program's applied, skills-oriented curriculum, which produces graduates with strong technical and analytical skills who are widely employed both domestically and abroad in important industries like telecommunications, aviation, mining, energy, manufacturing, and academia. Sustained relevance and industry alignment are indicated by positive employer feedback and the rise of graduates in consulting positions. The School of Applied Physics has five Postgraduate programs; research-based Doctor of Philosophy (PhD), Master of Philosophy (MPhil), and course-based Master of Science (MSc) in Electronics and Instrumentations, Master of Technology (MTech) in Exploration Geophysics and recently introduced Masters in Climate Change and Renewable Energy Access. The more recent BEBE program prepares graduates to oversee and maintain vital medical equipment in hospitals, supporting efficient diagnosis and patient care. It is strategically aligned with the nation's healthcare needs. Overall, the programs have a growing impact, clear career pathways, and strong academic and industry relevance.

There is enormous interest among students in the school's postgraduate programs. In 2025, three students completed their Master's degrees—two from the MSc in Applied Physics program and one from the MTech in Exploration Geophysics. In addition, the school currently has three PhD students continuing their research. The school remains committed to further strengthening its postgraduate programs and advancing research activities.

Research Focus

Through a wide and cohesive portfolio that tackles both national priorities and international scientific challenges, the School of Applied Physics exhibits strong research quality. While keeping a strategic focus on energy, spectroscopy, and advanced materials like nanotechnology and 2-D systems, its work encompasses both core and applied fields, such as astrophysics, condensed matter, atmospheric and environmental physics, nuclear and radiation physics, electronics, and geophysics. Particularly in the energy, healthcare, and resource sectors, the incorporation of applied domains such as medical physics, non-destructive testing, and geophysical exploration demonstrates evident industry and societal relevance. Papua New Guinea's responsiveness to new technological demands is further demonstrated by innovation in microcontroller-based systems and renewable energy applications. Furthermore, long-term STEM competence is strengthened by the focus on physics education research. All things considered, the program demonstrates a strong alignment between applied research, basic science, and national development objectives.

Staff Profiles

Name	Designation	Research Expertise and Interests
Felix Pereira	Professor	Astrophysics, Atmospheric physics, Radiation physics and Electronics
Panakal John Jojo	Professor	Nuclear and radiation Physics, Environmental Physics
Manoj Mukhopadyay	Professor	Applied Geophysics
Dapsy Olatona	Associate Professor	Energy and spectroscopy

Velusamy Senthilkumar	Associate Professor	Energy nanomaterials, 2-D materials, Solar cells and Oxide resistive memories
Gabriel Anduwan	Senior lecturer	Energy applications, Geophysics, Nanotechnology, Environmental Physics, Physics Education, Condense Matter and other applications of Physics using Microcontrollers and Electronics
David Kolkoma	Senior Lecturer	Medical Physics, Radiation Physics
Ali Mohamad	Senior lecturer	Applied Geophysics in Oil, Gas, and minerals
Suame Ampana	Lecturer II	Applied Geophysics and Non-Destructive Test (NDT)
Michael Gaoma	Lecturer II	Education
Sylvester Tyrones	Lecturer I	Microcontrollers and Microprocessor applications
Kenson Tonny	Lecturer I	Microcontroller- based Projects, Smart Hybrid Renewable Energy Systems, Data Acquisitions and Smart Monitoring Mechanisms for Renewable Energy Systems and Aircraft Tracking Systems in PNG

Major Professional Recognitions, Accomplishments and Awards

Name of the staff and Student	Designation	Award/ recognition	Awarding body	Level (National/Regional/ International)
Professor Felix Pereira and Mr Wellington Melpa	Post Graduate Research 2024-2025.	Fulbright Scholarship	Bureau of Education and Cultural Affairs, US Department of State.	International

Undergraduate Student Projects

Student name	Program	Project Title	Supervisor/s
William Jerewai, Piason Agema, Hedson Nicholas	BSAP4	*Geophysics & Petroleum Prospectivity of Fly Platform, PNG*	Prof. M. Manoj
Kale Yal, Maxie Uwokowo, Miyo Tony Turcovic	BSAP4	*Smart Vibration Monitoring System*	Prof. Felix
Gera Yapriha Kevin Kiwai	BSAP4	*Microcontroller Controlled Renewable Sources for Isolated Homes*	Prof. Felix
Dominic Kawa	BSAP4	*Designing of a Low-Cost Digital Temperature Sensor*	Prof. Felix
Umana Bhalaii	BSAP4	*Wireless Power Transmission Through Beamforming for Efficient Charging of Mobile Devices*	Prof. Felix
Luana Joseph Carolyne Kome	BSAP4	*Predictive Maintenance of HPAL Autoclave Agitator using ML*	Prof. Felix

		Algorithms for Temperature - Induced Failures	
Randol Gongilo	BEBE4	*Wearable Biosensors for Early Diagnosis of Health Conditions*	Prof. J. Jojo
Cassandra Cidar Koko	BEBE4	*Comparative Analysis of Piezoelectric Pulsed Jets and HIFU for Precision Ophthalmic Applications*	Prof. J. Jojo
Natalie WATTZ	BEBE4	*Mammary Gland Tissue Phantoms for Precision Treatment in Radiation Therapy*	Prof. J. Jojo
Tania Jinga	BEBE4	*Transcranial Ultrasound Stimulation for the Treatment of Children with Autistic Spectrum Disorder*	Prof. J. Jojo
Abigail Agon	BEBE4	*AI-Based Brain Tumor Segmentation for Enhanced Radiation Therapy Planning*	Prof. J. Jojo
Henao Willie	BEBE4	*Randon Measurement in Water*	Prof. J. Jojo
Paul Gerason Zhartica Babanki	BEBE4	*A Design and Construction of a Prototype Hydro-Powered Water Pump for Community in EHP*	Prof. J. Jojo
Solomon Tuvut Roger Willie	BSAP4	*Spectrophotometer Analysis*	A/Professor. D. Olatona
John Gaiva	BSAP4	*Proposal for a Wireless Power Theft Monitoring System in Papua New Guinea*	A/Professor. D. Olatona
Junior Oumba Thomas Tonny	BSAP4	*The Design and Construction of a Portable Vaccine-Preservation Prototype Fridge for Rural Application in PNG*	A/Professor. D. Olatona
Raymond Tommy LAHUI-AKO A'aron Sidney Jason Numbaru	BSAP4	*Design and Operational Principles of Photodetectors: A Bottom-Up Approach*	A/Professor. V. Senthilkumar
Jamie-Shiel Kuikui	BSAP4	*Programming Arduino Microcontroller for Multi Sensor Data Logging*	Dr. G. Anduwan
Shiloh Tugula Daniel Toll Joseph Pochapon	BSAP4	*Geological aspects for Geothermal reservoir*	Dr. Ali
Samuel Tano Emmanuel Ningimori	BSAP4	*Sterilization of mosquitoes using gamma-rays a case study*	Dr. D. Kolkoma
Jedidiah Wallum	BSAP4	*Nuclear Energy Generation along term plan for Sustainable Energy in PNG*	Dr. D. Kolkoma
Donoven Bandi Oscar Bausambi	BSAP4	*Nuclear Waste Management in PNG: A Case study*	Dr. D. Kolkoma
Monalisha Smith Viti Sali	BEBE4	*Modeling of the Cardiovascular System using Equivalent Electrical Circuits*	Dr. H. Kamran

Jezriel Buakao	BEBE4	*Modeling of the Heart Using Electrical Methods*	Dr. H. Kamran
Anita ABBA Wii	BEBE4	*AI Enhanced Mamogram Classification for Early Breast Cancer Detection*	Dr. Kafagy
Natasha Jonny Jaylin Naepukali	BEBE4	*Low-cost Prosthetic Hand with Simple Sensors*	Dr. Kafagy
Roberta Taipu	BEBE4	*Cuffless Blood Pressure Estimation Algorithms for Continuous Healthcare Monitoring*	Dr. Kafagy
Jordan Nabes Owen Butler Richard Junior	BSAP4	*Automated Park Light Switch (LDR based)*	Mr. G. Aiyowa
Harry Masibameng	BSAP4	Magnetic Anomaly Detection System for Mineral Exploration	Mr. K. Tonny
Jephtah Los Elton Jeff	BSAP4	Integration of a Smart Alcohol Monitoring System into Vehicles using Arduino Uno Microcontroller	Mr. M. Waimbo
Alistair Kichawen	BSAP4	Satellite-Based Resonance Frequency Technology and its Further Applications in PNG's Resource Extraction Industry	Mr. M. Waimbo

Postgraduate Student Projects

Student name	**Program**	**Project Title**	**Supervisor/s**
Cyril Jr. Tapoiye	M.Sc.	*Eliminating Organic Water Contaminants Using Advanced Nanomaterials*	A/Prof. V. Senthilkumar
Ralph Ulaoko	M.Sc.	*Feasibility Study and Optimal Design of Hybrid Photovoltaic (PV) Solar-Micro-Hydro Power Supply to Bena SDA High School-EHP*	A/Professor. D. Olatona
Joshua Gaima	MTech	*Identification of Hydrocarbons Reservoir and its Petrophysical Analysis for Formation Evaluation by the Help of Open Hole Logging Tools*	Dr. Ali

Funded Staff Research and Development Projects

Project Title and Number:	*Assessment of radiation dose to the population in Lae (Morobe Province) and Kundiawa-Gembol (Simbu Province) of Papua New Guinea*
Funding Source (PNGUoT/External): If external, specify.	PSR & IC
Project Duration:	2 years
Funding Amount:	PGK 15,000
Project Team:	Prof Jojo Panakal John Dr David Kolkoma Mr Maine K Wau

Outputs, Outcomes and Key impacts:	Project is going on and primary results are communicated

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Jojo Panakal John	Executive Editor	*Interdisciplinary Journal of Papua New Guinea University of Technology*	PNGUoT Press	2024 onwards

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
Jojo Panakal John	Member	Institute of Physics (IoP)	UK	2025

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
CSIRO, Australia	Australia	Joint research and capacity building	15 Mar 2025	2025-2028	-

Research Outputs

Journal Articles

Dopaim, M., & Pereira, F. (2025). Causes and effects of climate variability in Papua New Guinea. *Interdisciplinary Journal of PNG University of Technology, 2*(1). 70-77. https://doi.org/10.63900/5jszrb03

Hassani, K., Kolkoma, D., & Aghaeiboorkheili, M. (2025). Hemodynamics variations of umbilical vein and ductus venosus due to different material properties. *Interdisciplinary Journal of PNG University of Technology, 2*(1), 58-66.

Monica, S., Christopher, B., & John, J. P. (2025). Study of indoor 222Rn and 220Rn progeny using augmented passive detectors. *International Journal of Radiation Research, 23*(3), 731–736. http://dx.doi.org/10.61882/ijrr.23.3.30

Osora, H., Edison, T. J. I., Kolkoma, D., Anduwan, G., Waimbo, M., & Velusamy, S. (2025). Electrochemical energy storage studies on sustainably synthesized Co_3O_4 nanoparticles for supercapacitor electrodes. *Nano Energy Frontiers and Materials, 4*(2), Article 689. https://doi.org/10.55121/nefm.v4i2.689

Mukhopadhyay, M., Mukhopadhyay, B., Mogren, S., & Ibrahim, E. (2025). Rheological evidence for a probable rarefied crust and fracture characterization under northern Harrat Rahat, SW Saudi Arabia: Its significance for geothermal prospects. *London Journal of Research in Science: Natural & Formal, 25*(2), 48–62.

Pereira, F. B., & Sekere, J. (2025). Possible ionospheric effects of two major earthquakes in Papua New Guinea. *Journal of Atmospheric and Solar-Terrestrial Physics, 269*, 106457. https://doi.org/10.1016/j.jastp.2025.106457

Sakarias, L., Kolkoma, D., Pereira, F. B., & John, J. P. (2025). Dose and risk assessments of soil-borne radionuclides in Markham and Huon Gulf districts of Morobe Province in PNG. *Pollution Research, 44*(3–4), 141–147. https://doi.org/10.53550/PR.2025.v44i03-04.003

Thankachan, T. N., James, N. R., John, J. P., & Bijini, B. R. (2025). Development, characterization and radiation dosimetry evaluation of bovine gelatin crosslinked with gum arabic aldehyde as brain phantom gel material in radiation therapy. *Radiation Physics and Chemistry, 229*, 112416. https://doi.org/10.1016/j.radphyschem.2024.112416

Thankachan, T. N., James, N. R., John, J. P., & Bijini, B. R. (2025). Experimental assessment of linear and mass attenuation coefficients of G-GAAB gel by narrow beam geometry with gamma rays and dual energy X-rays. *Radiation Physics and Chemistry, 237*, 113143. https://doi.org/10.1016/j.radphyschem.2025.113143

Tirones, S., & Hu, Y. (2025). Design and implementation of a low-cost IoT-based smart energy meter using ESP32 and cloud monitoring. *International Research Journal of Advanced Engineering and Science, 10*(3), 134–140.

Tirones, S., & Hu, Y. (2025). Design and simulation of an MPPT-controlled boost converter for solar PV-based charging and load support of a 48V battery system. *International Journal of Research Publication and Reviews, 6*(9), 1713–1725. https://doi.org/10.55248/gengpi.6.0925.3307

Tirones, S., & Hu, Y. (2025). Energy survey and MATLAB/Simulink simulation of 24VDC lighting systems for off-grid rural houses in Papua New Guinea. *Engineering Science & Technology Journal, 6*(11). 613-625. https://doi.org/10.51594/estj.v6i11.2132

Tirones, S., & Hu, Y. (2025). Keypad programmable reference voltage generation for DC–DC converters using Arduino PWM: Proteus simulation and filter optimization. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(2), 99-110. https://doi.org/10.63900/xyfn2a22

Tirones, S., & Hu, Y. (2025). A programmable multi-voltage battery charger using PIC16F877A: Proteus-based design and simulation for renewable energy applications. *International Journal of Advanced Engineering Research and Science, 12*(11), 44–51. https://doi.org/10.22161/ijaers.1211.6

Tirones, S., & Kumar, R. (2025). Automatic 12 volt battery charge controller for telecommunication systems. *International Journal of Inventive Engineering and Sciences, 12*(5), 25–31. https://doi.org/10.35940/ijies.E1104.12050525

Tirones, S., Hu, Y., Teke, S., & Menau, Z. (2025). Design and implementation of smart rural home water supply system using PIC microcontroller and solar energy. *International Journal of Emerging Science and Engineering, 13*(6), 1–9. https://doi.org/10.35940/ijese.F2601.13060525

Conference Presentations

John, J. P., Kolkoma, D., & Pereira, F. (2025, July 1–3). *Estimation of lifetime lung cancer risk from radon inhalation in Lae, Papua New Guinea*. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Pereira, F., Gaoma, M., & Maino, M. (2025, July 1–3). *An analysis of cultural intelligence in different regions of Papua New Guinea based on physics education*. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae, Papua New Guinea.

SCHOOL OF APPLIED SCIENCES

Head of the School: Dr. Lydia R-Yalambing

Introduction

Bachelor of Science in Applied Chemistry and the Bachelor of Science in Food Technology are the two (2) Bachelor degree programs offered at the School of Applied Sciences. The Postgraduate programs offered include the Master of Philosophy in Applied Chemistry and Master of Philosophy in Food Technology; Doctor of Philosophy in Applied Chemistry and Doctor of Philosophy in Food Technology. This year, the new Master of Science in Applied Chemistry coursework program was launched. The curriculum of the Master of Science in Food Science & Technology is being written after conducting needs surveys with relevant stakeholders.

The running of the MSc in Applied Chemistry for the first time this year helped us identify gaps that we needed to bridge in terms of skilled manpower to teach at that higher level and the challenges in acquiring relevant instruments/equipment, laboratory facilities to support the laboratory needs of our increasing number of postgrad students as well as staff research. Some of the capacity building achievements in our PG studies and research this year included getting funding approval from the Vice Chancellor's office for the procurement of some of the main equipment/instruments for research in Nanotechnology so in the future we should see a lot of research, training and innovation in this area. We also got a grant from the PNG Science and Technology Secretariate for the Bioprospecting project which will contribute to boosting capacity in that area of chemistry in training as well as equipment. We have a strong connection with colleagues in the Food Science and Technology at UNSW facilitating potential collaboration in research and benchmarking. Moreover, the renovation and refitting of the food processing pilot plant funded by our industry partners, the National Fisheries Authority which commenced this year will significantly enhance teaching and learning as well research in food processing, postharvest studies and technologies, downstream processing, and product development.

Research Focus

The school's research focus aligns with its mission "To focus on high-class teaching and quality research, continuously striving to produce future leaders, rich in intelligence and innovations in the field of Applied Chemistry and Food Technology and simultaneously concentrate in strengthening and enlightening the community". The community impact projects are centred around empowering the communities and creating enabling environment in the communities through downstream processing and product development where communities can use what they have to improve their living standards.

The undergraduate research projects are aligned with the research interest and subject areas of each of the supervising lecturers. Recruitment of staff strengthens and enhances research and training in specific areas of expertise contributing to the school's overall research outputs for the year.

In Food Technology – generally, the undergraduate and postgraduate research projects are around the areas of food processing, post-harvest studies and technologies, product development for both food and animal feed, improving nutritional quality of staples through fermentation studies, food composition studies, food quality and food safety.

In Applied Chemistry – the undergraduate research projects, the postgraduate projects are in the areas of environment pollution, microplastics, instrumental methods of analysis, material science, phytochemistry, areas of organic chemistry, compositional studies of food and pharmaceutical products. Recent increased interests in synthesis, characterization and applications of composite materials, and nanotechnology.

Staff Profiles

Applied Chemistry Section

Name	Designation	Research interests
Professor Ananda Murthy	Professor	Synthesis, Characterization and Applications of Composite Materials and Nanomaterials for Biomedical, Sensor and Environmental Applications
Dr. Srikanth Bathula	Assoc. Professor	Chemical Speciation and Bioavailability, Environmental studies, Geomorphological Impact Assessment on Groundwater Quality, Coastal Groundwaters–Geo-hydro Chemical Exploration, Photocatalytic Activity and Degradation, Synthesis and Characterization of Nanomaterials. Investigation of Oil Samples at Seawater Sources
Dr. Janarthanan Gopalakrishnan	Assoc. Professor	Synthetic Inorganic Chemistry, Inorganic Chemistry in Traditional Practices, Environmental Pollution Studies and Development of Sustainable Solutions, Composite Friction Materials
Dr. David Timi	Senior Lecturer	Organic Chemistry, Phytochemistry
Mr. Justin Narimbi	Lecturer II	Analytical Chemistry, Environmental Chemistry, Instrumental Methods for Analysis, Water Quality Assessment and Monitoring, Laboratory Quality Management
Dr. Jason Wau	Lecturer II	Green Chemistry and Natural Product Chemistry
Mr. Kaupa Philip	Lecturer I	Nanomaterials for Biomedical, Sensor and Environmental Applications

Food Technology Section

Name	Designation	Research interests
Dr. G Tolesa	Senior Lecturer	Integrated Postharvest Pre-Storage Treatments and Technologies to Extend the Shelf-Life of Fresh Produces (Fruit, Vegetables, Tubers, Root Crops, Spices and Cash Crops). Agro-Food Processing and the Value-Additions of Food Materials. Cooling, Drying, and Packaging Research (Heat and Mass Transfer, Fluid Flow (CFD), Kinetics, Modelling in Food Materials and Processing). Computer-Aided Design and Food Process Optimization in Agro-food Processing and Engineering. Postharvest Technology Transfer in Agro-Food Value Chain
Dr. S. Palaniappan	Senior Lecturer	Current Areas of Interest; Assessment of Mycotoxin Contamination in PNG's Export Commodities; Producing Biogas from Fish Industry Waste as an Innovative and Sustainable Method for Both Waste Management and Energy Production. Studying Lactic Acid Fermentation of Local Root Crops in PNG to Boost their Nutritional Quality
Mr. R. Nigo	Lecturer II	Renewable And Clean Energy, Animal Feed Development, Thermal Processing, Food Drying Studies Using Solar and Clean Energy Systems, Food Product Development Processes
Dr. L. Yalambing	Senior Lecturer	Food Composition Studies, Nutrition Sensitive Agriculture, Nutrition Intervention Studies; Complementary/Supplementary Food Development
Mrs. S. Denano	Lecturer II	Food Safety and Food Security; Compliance Studies

Major Professional Recognitions, Accomplishments and Awards

Name of the staff	Designation	Award/ recognition	Awarding body	Level (National/Regional/ International)
Professor Ananda Murthy	Professor	Featured in World's TOP 2% Scientist list for 2025	Stanford University	International
Professor Ananda Murthy	Professor	Fellow- (FRSC-UK)- 2022-2026	Royal Society of Chemistry- UK	International

Undergraduate Student Projects
BSc Applied Chemistry – BACH 4 research projects

Student	Supervisor	Project Title
Bernard Lessou Kiele	Dr. D Timi	*Biological Assessment of Volatile Oil of Myrtaceae Species (Eugenia spp.)*
Nissie Malam	Dr. D Timi	*Chemical Analysis of Edible Fruits and Leaves of Ficus brusii for Phenolic Compounds and Toxic Elements*
Christopher Avuchulas	Dr. D Timi	*Biological Assessment of Volatile oil of Myrtaceae Species (Syzygium spp.)*
Eldah Garai	Dr. D Timi	*Nutritional Analysis of Ficus brasii*
Shahnaz Sarwon	Prof. A Murthy	*Green Synthesis of MnO_2 Nanoparticles Using the Aqueous Watermelon Peel Extract: Investigation of Their Antibacterial Activities*
Singnu Akesingnu	Prof. A Murthy	*Green Synthesis of NiO Nanoparticle Using the Aqueous Orange Peel Extract: Investigation of Their Antibacterial Activities*
Victoria Vela	Dr. Janarthanan	*Studies on Biodegradable Fibers: Use of Common Lawn Grass as Sustainable Sources for Food Packaging*
Hadasha Po-owa	Dr. Janarthanan	*Estimation of Microplastics in Various Brands of Bottled Water Sold in Lae Supermarkets*
Shirley Wangikia	Dr. Janarthanan	*Attempts to Synthesize Potassium Titanate Whiskers Through Solid State Reactions and Their Modifications*
Vanessa Lerori	Dr. S Bathula	*A Quantitative Analysis of the Fat and Saturated Fat Levels in Dairy Products Available in Papua New Guinea*
Tanya Luluaki	Dr. S Bathula	*Stability Investigations Concerning Pharmaceutical Products Accessible in Papua New Guinea*
Jackyta Toban	Dr. S Bathula	*Quantitative Examination of Food Preservatives Employing Spectroscopic Methodologies*
Donnah Lunen	Dr. S Bathula	*A Quantitative Examination of Calcium and Sodium Concentrations in Dairy Products Accessible in Papua New Guinea*
Ebony Miriung	Mr. J Narimbi	*Verification of an ICP-MS Method for Heavy Metal Analysis in Canned Tuna*
Lincoln Paul	Mr. J Narimbi	*Verification of an ICP-MS method for Heavy Metal Analysis in Rice*
Mek Dennis	Mr. J Narimbi	*Comparative Study of Sample Digestion Techniques for Heavy Metal Analysis in Food*
Joy Marita	Dr. J Wau	*Concentration of Vanilla Extract by in situ Vacuum Distillation*
Harmsi Siune	Dr. J Wau	*Screening of Natural UV Active Organic Sensitizers*

Otto Yallon	Dr. J Wau	*Production of Xylose from Oil Palm Empty Fruit Bunch and Sugarcane Bagasse*
Valentina Sambath	Mr. Philip	*Base-Functionalized Betel Nut Husk for Methylene Blue Removal: Isotherm and Kinetic Modelling Studies*
Abraham Polipa	Mr. K Philip	*Removal of Congo Red Dye from Aqueous Solution Using Acid Modified Betel Nut Husk: Kinetics and Isotherm Analysis*

BSc Food Technology – BFTE 4 research projects

Student	Supervisor	Project Tile
Bill Bruckner	Mrs RG-Sipou	*Microbiological Quality and Antibacterial Efficacy of Herbal Products Sold in Lae, Morobe Province, Papua New Guinea*
Bino Razzy	Dr G Tolesa	*Effects of Extrusion Cooking on the Soya Extrudate Quality*
Bunaga Martin	Mr R Nigo	*Further Studies on Cocoa Product Development*
Ep Ezekiel	Mrs RG-Sipou	*Quality and Sensitivity Test of E. Coli, S. aureus & Salmonella in Supermarket and Street-Vended Ready-to-Eat Foods in Lae*
Francis Michael	Ms D Bau	*Determination of Cyanide Content in Cassava*
Gari Emma	Dr G Tolesa	*Effects of Drying Methods and Pre-Treatments on the Quality and Functional Properties of Some PNG Fruits (Wild and Common Fruits)*
Hambaghunia Joshua	Mrs R G-Sipou	*Studies on Antibacterial Resistance of Escherichia coli and Salmonella Isolated from Locally Produced and Imported Beef Meat in Papua New Guinea*
Heri Phil	Dr L Yalambing	*Determining of Physicochemical Compositions, and Sensory Evaluation of New Variety of Rice Bred and Grown at the PNGUoT Farm*
Inax Birellsa	Mr N Kiaka	*Developing a Low-Cost High-Pressure Processing Equipment*
Iobuna Rotona	Mr R Nigo	*Biofuel Extraction from Woods as a Renewable Energy Source*
James Junior	Dr S Palaniappan	*Effect of Lactic Acid Bacteria (LAB) Fermentation on Nutritional and Antinutritional Properties, and Sensory Quality of Fermented Yam Pancake*
Meakoro Chaira	Mrs S Denano	*Analyzing Heavy Metals in Plant Samples along Markham River System*
Morua Merilyn	Dr G Tolesa	*Effects of Packaging and Storage Conditions on the Green Leafy Vegetable's Quality Parameters and Storage Life*
Musas Corney	Mr Reilly Nigo	*Waste to Energy Studies Using Fish Waste*
Nambri Mason	Dr S Palaniappan	*Effect of LAB Fermentation on Nutritional and Antinutritional Properties, and Sensory Quality of Fermented Cassava pancake*
Osborn Aquila	Dr S Palaniappan	*Effect of LAB Fermentation on Nutritional and Antinutritional Properties, and Sensory Quality of Fermented Sweet Potato Pancake*
Pala Tamara	Dr G. Tolesa	*Combined Effect of HPH and Thermal Treatments on Beta-Carotene Content of Juice/Pulp/Puree and Characterization from PNG Fruits*

Poya Toko	Ms D. Bau	*Analysis of Absorbance Quality of Fresh Produce Peel*
Kaboanga Joseph	Mr R Nigo	*Clean Bio Fuel from Wood Wastes*

Postgraduate Student Research

Student	Degree	Topic	Principle Supervisor
Justin Narimbi	PhD	Synthesis *and Applications of Novel Zeolite Imidazolate Framework (ZIF) Hybrid Materials*	Dr. S. Balakrishnan
Sogoing Denano	PhD	*Ecological Risk Assessment of Selected Rivers in Papua New Guinea: A Case Study in Relation to Heavy Metals Contamination, Severity of Sediment Perturbation, and Food Safety*	Dr. Timi & Professor Okpul
Kaupa Philip	PhD	*Synthesis of Rare Earth Metal Doped ZnO Supported on S-Doped Graphitic Carbon Nitride ($G\text{-}C_3N_4$) for Applications in Adsorption, Photodegradation, and Sensing of Environmental Pollutants*	Professor A Murthy
Ruthia Kisi	MPhil	*Quality Evaluation of Selected Commodity Products from PNG Using ICP-OES & Capillary Electrophoresis*	Dr. S Balakrishnan
Getrude Pogo	MPhil	*Baseline Studies on Estimation of Microplastics in Commonly Sold Fruits, Vegetables and Seafoods In Papua New Guinea*	Dr. J Gopalakrishnan
Sibron Bingmalu	MPhil	*Utilization of Dried Noni Fruit Waste to Boost Growth Performance and Nutrition of Broiler Chickens at the Grower Stage*	Dr. G Tolesa

Funded Staff Research and Development Projects

1. Research Grant from PNG Science & Technology Secretariat
   A research grant worth PGK 300,000.00 was awarded to PNG University of Technology (PNGUoT) – Applied Sciences through an agreement with the PNG Science and Technology Secretariat in September 2025, with initial funds transferred in December 2025. The grant supports research in bio-prospecting PNG's biota to identify molecules with potential applications in cosmetics, agriculture, medicine, and other industries. The project also aims to develop consumer products such as insecticides from these biomolecules.
   Principal Investigator: Dr. David Timi

2. PNGUoT Funded Staff Research.
   A project on *Green synthesis of silver-based multi-metallic nanomaterials mediated by extracts of medicinal plant species of Papua New Guinea for potential antibacterial and sensor applications* was sanctioned for PGK 37,768.20 on 1 August 2024. The research is currently in progress.
   Principal Investigator: Prof. Dr. H. C. Ananda Murthy
   Team Members: Dr. David Timi, Mr. Philip Kaupa

Editorial Board Memberships and Peer-Review Contribution

Name	Role	Journal	Publisher	Period
Professor Ananda Murthy	Managing Editor	*Académique Journal of Quality*	Exegium Scholarly Press	2025

Dr. Selvakumar Palaniappan	Reviewer	*Journal of Food Science and Technology*	Springer, The Netherlands	2024
Dr. Selvakumar Palaniappan	Reviewer	*Journal of Food Science and Technology*	Springer, The Netherlands	2025
Dr. Selvakumar Palaniappan	Reviewer	*Applied Fruit Science*	Springer, The Netherlands	2025
Dr. Getachew Tolesa	Reviewer	*Applied Food Research*	Elsevier	2025
Dr. Getachew Tolesa	Reviewer	*Journal of Cereal Science*	Elsevier	2025
Dr. Getachew Tolesa	Reviewer	*Journal of Food and Humanity*	Elsevier	2025
Dr. Getachew Tolesa	Reviewer	*Journal of Horticulture*	Elsevier	2025

Professor Ananda Murthy was a reviewer for the following journals in the year 2025:-*Discover Nano, Journal of Herbal Medicine, Environment Technology and Innovation, Journal of Environmental and Chemical Engineering, Chemical Papers, Scientific reports, Microchemical Journal, Journal of Indian Chemical Society, Applied Physics, ChemSelect Journal, ACS Applied Nanomaterials, Ceramics International, Discover Nanomaterials, Journal of Material Science, Biophysical Chemistry, Advanced Material science and Engineering, Nanoscale Advances, Talanta , Topics in Catalysis, Optical Materials and Next Research*

Memberships and Affiliations with National and International Research Organizations

Name	**Membership Type**	**Organization/Professional Association**	**Country**	**Period**
Professor Ananda Murthy	Life Member LM 39951	The Indian Society for Technical Education- ISTE	India	Life
Professor Ananda Murthy	Life Member LM 148	The Electrochemical Society of India- ECSI	India	Life
Professor Ananda Murthy	Life Member LM 56	Indian Rubber Institute- IRI	India	Life
Professor Ananda Murthy	Life member	Chemical Society of Ethiopia	Ethiopia	Life
Professor Ananda Murthy	Life member	Catalysis Society of India- CSI	India	Life
Professor Ananda Murthy	Life Member L/M No. 2368	National Environmental Science Academy- NESA	India	Life
Professor Ananda Murthy	Annual	American Chemical Society- No.32456165	US	2025

Research Related Trainings Attended

Kaupa, P. (2025, November 17–21). *Training bootcamp for budding entrepreneurs in tech fields* [Training program]. United Nations Educational, Scientific and Cultural Organization (UNESCO), International Union of Pure and Applied Physics (IUPAP), & ET Cube International, Nadi, Fiji.

Tolesa, G. (2025, October 13–17). *Competitive research proposal writing for national and international grants* [Workshop]. Papua New Guinea University of Technology & Department of National Planning and Monitoring, Papua New Guinea.

Partnership and Community Engagement/Consultancy

External Research Project	Collaborators
Green Synthesis of Mono, Bi, Tri and Tetra Metallic NPs of Mn, Co, Zn and Cu Using Indigenous Medicinal Plants for Antimicrobial, Antioxidant and Anticancer Activities- Granted by ASTU, Ministry of Science and Technology, Government of Ethiopia. (Co-PI) (Active Project)	Dr. Bezu Mekite, Adama Science and Technology University, Ethiopia,
Quantum-Inspired Sensing Memory for Neuromorphic Computing in Next-Gen Data Centres (Under Review by Telecom Malaysia)	Prof. Ir. Dr. Chan Kah Yoong, Director, Centre for Advanced Devices and Systems, Faculty of Engineering, Multimedia University, Persiaran Multimedia, 63100 Cyberjaya, Selangor, Malaysia.

Community Impact Projects – Outreach, Awareness, Community Initiatives

Establishment of Markham Cocoa Downstream Processing Plant

A project is underway to establish a 10-ton-per-day cocoa downstream processing plant at the Waterrise Economic Centre in Umi-Atzera LLG, Markham District, with a total investment of K40 million. The project was officially launched on 16 May 2025, with an initial funding approval of K5 million to commence activities in 2026. The facility will include cocoa fermentation units, a solar drying system, processing plant, warehouse, and water and waste treatment infrastructure. The plant aims to produce cocoa butter and cocoa powder for export, as well as chocolate and cocoa-based drinks for local markets. Mr. Reilly Nigo will lead a team of experts to oversee the project.

Morobe Youth Empowerment Organization

The Morobe Youth Empowerment Organization provides training programs delivered by experienced professionals to support youths, women, and underprivileged communities in both urban and rural areas of Morobe Province. Training covers health, business development, SME setup, agriculture, downstream processing, mindset development, business innovation, practical entrepreneurship, and financial literacy, including connections to financial institutions. Mr. Reilly Nigo is a key facilitator in these programs.

Research Outputs

Journal Articles

Abdelhamed, A. H. E., Thien, G. S. H., Lee, C.-L., Au, B. W.-C., Tan, K. B., Murthy, H. C. A., & Chan, K.-Y. (2025). Solution casting effect of PMMA-based polymer electrolyte on the performances of solid-state electrochromic devices. *Polymers, 17*, 99. https://doi.org/10.3390/polym1701009

Ajay, K. M., Dinesh, M. N., Khasim, S., Somashekar, M. N., Ravikumar, C. R., & Murthy, H. C. A. (2025). Performance study of bamboo activated carbon and RuO_2 nanocomposite electrode material for supercapacitor applications in KOH electrolyte. *Chemical Papers*. https://doi.org/10.1007/s11696-025-03986-w

Alebachew, N., Demissie, T. B., Murthy, H. C. A., Gonfa, B. A., von Eschwege, K. G., Coetse, E., Langner, E. H. G., Jayadevh, & Doreswamy, B. H. (2025). Synthesis, characterization, and application of ternary CuO/ZrO_2@S-doped g-C_3N_4 hybrid nanocomposites. *RSC Advances, 15*, 6441. https://doi.org/10.1039/d4ra08941c

Ape, J., Bathula, S., Samanta, S., & Kotra, K. K. (2025). Assessment of toxic metals in an open dump site near PNG University of Technology, Papua New Guinea. *Nature Environment and Pollution Technology, 24*(2), 1–12. https://doi.org/10.46488/NEPT.2025.v24i02.D1713

Ape, J., Bathula, S., & Samanta, S. (2025). An assessment of the effects of groundwater quality parameters in proximity to the open dump site in the perimeter of PNG University of Technology. *Interdisciplinary Journal of Papua New Guinea University of Technology, 2*(1), 42–57. https://doi.org/10.63900/gzsxac45

Chandra, P., Patel, A. K., Sachan, N., Kabra, A., Singh, N., Alshammari, A., Albekairi, N. A., & Murthy, H. C. A. (2025). Evaluation of antiallergic conjunctivitis effects of extract of *Nelumbo nucifera* rhizome and its isolated constituents against chemical-induced allergic conjunctivitis in experimental rats. *Journal of Chemistry, 2025*, Article 6747119. https://doi.org/10.1155/joch/6747119

Chenrayan, V., Natarajan, P., Tamilperuvalathan, S., Shahapurkar, K., & Murthy, H. C. A. (2025). Enhancing flexural performance of friction-stir-processed Al composites via SiC and Y_2O_3 reinforcements: A combined experimental and numerical study. *Emergent Materials*. https://doi.org/10.1007/s42247-025-01280-9

Eldjilali, C. Z., Thien, G. S. H., Ng, Z.-N., Yap, B. K., Tan, K. B., Murthy, H. C. A., & Chan, K.Y. (2025). Electrochromic performances of TiO_2 nanocrystals thin films for smart glass applications. *Thin Solid Films, 815*, 140636. https://doi.org/10.1016/j.tsf.2025.140636

Gebremaryam, G., Shahapurkar, K., Chenrayan, V., Kanaginahal, G., Valdivia Rojas, P., Arunachalam, K. P., Rajagopal, R., & Murthy, H. C. A. (2025). The structural and thermal integrity of novel bio-polymer composites processed from Ethiopian teff husk particles for constructional applications. *Journal of Polymer Research, 32*, 6. https://doi.org/10.1007/s10965-024-04239-2

Khaw, C. C., Tan, P. Y., Tan, K. B., Chan, K. Y., Murthy, H. C. A., Balachandran, R., Che, S. K., Kechik, M. M. A., Lee, O. J., & Lu, M. (2025). Investigating the potential of Zn^{2+}, Cd^{2+} and Ni^{2+} substituted bismuth magnesium tantalate pyrochlores as a new class of ceramic dielectrics. *Journal of the Indian Chemical Society, 102*, 101637. https://doi.org/10.1016/j.jics.2025.101637

Mesfine, F. M., Tolesa, G. N., Habtegebriel, S. A., & Negewo, D. L. (2025). Effects of calcium lactate treatment on the storage period and postharvest attributes of strawberry fruit. *Applied Fruit Science, 67*, 410. https://doi.org/10.1007/s10341-025-01634-x

Ripanda, A., Rwiza, M. J., Reddy, S. G., Nyanza, E. C., Bakari, R., Miraji, H., Ravikumar, C. R., Murthy, H. C. A., Vuai, S. A. H., Machunda, R. L., & Annamareddy, S. H. (2025). Jamun seed (*Syzygium cumini*) biochar as a potential adsorbent for environmental applications. *ES Food and Agroforestry, 19*, 1415. https://doi.org/10.30919/faf1415

Ripanda, A., Rwiza, M. J., Nyanza, E. C., Miraji, H., Alfred, M. S., Mahmoud, A. E. D., Murthy, H. C. A., Bakari, R., Vuai, S. A. H., & Machunda, R. L. (2025). Ecological consequences of antibiotics pollution in sub-Saharan Africa: Understanding sources, pathways, and potential implications. *Emerging Contaminants, 100475*. https://doi.org/10.1016/j.emcon.2025.100475

Sadeq, F. A., Eldjilali, C. Z., Low, P. L., Thien, G. S. H., Tan, K. B., Murthy, H. C. A., Ashraf, M. A., & Chan, K.Y. (2025). Comparison study of natural dye sensitizers in dye-sensitized solar cells. *Journal of Engineering Technology and Applied Physics, 7*(2). https://doi.org/10.33093/jetap.2025.7.2

Sishu, N. K., Selvaraj, C. I., Arunachalam, K. P., & Murthy, H. C. A. (2025). Therapeutic potential of *Anamirta cocculus* leaf aqueous extract-mediated biogenic gold nanoparticles. *Green Processing and Synthesis, 14*, 20250073. https://doi.org/10.1515/gps-2025-0073

Surendra, B. S., Sowmya, H. N., Kiran, T., Bhaskar, M., Rajappa, S., Uma, B., Khasim, S., Murthy, H. C. A., & Chan, K. Y. (2025). Emerging applications of sustainable modified CdO/Ag-CdO NPs for

electrochemical sensitive and selective detection of mercury heavy metal. *Scientific Reports, 15*, 28200. https://doi.org/10.1038/s41598-025-11691-7

Tadesse Ayanie, G., Desalegn Zeleke, T., Murthy, H. C. A., Tif, L. T., & Godana, A. A. (2025). In vitro anti-cancer and antioxidant activity of biogenically synthesized Co_3O_4@NiO core-shell nanostructures. *Nanomedicine Journal*, 12(3), 473–499. https://doi.org/10.22038/nmj.2025.79882.1972

Temesgen, T., Bekele, E. T., Gonfa, B. A., Ravikumar, C. R., Tufa, L. T., Khasim, S., Tsegaye, D., Murthy, H. C. A., & Dessie, Y. (2025). Preparation and capacitor optimization of MnO_2/AC using I-optimal coordinate exchange model. *Results in Chemistry, 16*, 102383. https://doi.org/10.1016/j.rechem.2025.102383

Teseme, W. B., Habtegebreil, S. A., & Tolesa, G. N. (2025). Study on the selected engineering properties of anchote starch-based biodegradable film for food packaging. *Applied Food Research, 5*(2), 101282. https://doi.org/10.1016/j.afres.2025.101282

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Tolesa, G. N., Aweke, C. S., Wordofa, M. G., Endris, G. S., Tefera, T. L., Hassen, J. Y., & Mottet, A. (2025). Institutional and infrastructure setup for sustainable food supply of home-grown school feeding and productive safety-net program: Evidence from Ethiopia. *Food and Humanity, 5*, 100883. https://doi.org/10.1016/j.foohum.2025.100883

Yogeesha, N., Shivakumara, S., Ravikumar, C. R., & Murthy, H. C. A. (2025). Green and chemical fuel driven solution combustion synthesis of La_2O_3 nanoparticles for their photocatalytic and electrochemical studies. *Ionics, 31*, 8335–8356. https://doi.org/10.1007/s11581-025-06474-z

Conference/Seminar Presentations

Anis, S., Timi, D., Lebouvier, N., Maino, M., Bau, B., Wau, J., & Oelgemoeller, M. (2025, July 1–3). Chemical and biological investigation of PNG Xanthostemon species of the Myrtaceae family [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network (PIURN) Conference, Papua New Guinea University of Technology, Lae.

Arcot, J., Yalambing, L., & Lee, A. (2025, July 1-3). Biofortification of staple crops in PNG towards a sustainable future ensuring food and nutrition security. Paper presented at the 6th PIURN Conference, Papua New Guinea University of Technology, Lae, PNG.

Jamilah, I., & Janarthanan, G. (2025, July 1-3). Preliminary results on development of sustainable and biodegradable food packaging films using the peels of indigenous banana plant Musa ingens from Enga Province of Papua New Guinea. Paper presented at the 6th PIURN Conference, Papua New Guinea University of Technology, Lae, PNG.

Janarthanan, G., Sakthi, S. J., Nanditha, R., Sudharsan, S., & Jonathan, M. P. (2025, July). Unravelling floating marine debris in two coastal cities of Papua New Guinea: Sentinel-2 spectral analysis. Paper presented at the 6th PIURN Conference, Papua New Guinea University of Technology, Lae, PNG.

Kaupa, P., Ku, S., & Pragasan, A. (2025, July). Acid treated betel nut husk for dye removal: Adsorbent characterization, adsorption isotherms and kinetic studies. Paper presented at the 6th PIURN Conference, Papua New Guinea University of Technology, Lae, PNG.

Edited Books

Ananda Murthy, H. C., Subramaniam, V., Sillanpää, M., Balachandran, R., & Hegde, G. (Eds.). (2025). *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed.). CRC Press. https://doi.org/10.1201/9781003501596

Hakeem, K. R., Tonelli, F. M. P., Oliveira, L. F. de, & Ananda Murthy, H. C. (2025). *Green nanoparticles: Valuable tools for the food sector* (Hardcover, est. 466 pp.). Apple Academic Press. https://www.appleacademicpress.com/9781779640185

Book Chapters

Demissie, T. B., Alebachew, N., & Ananda Murthy, H. C. (2025). Chapter 1: Historical background of multifunctional inorganic materials and their applications. In H. C. Ananda Murthy, V. Subramaniam, M. Sillanpää, R. Balachandran, & G. Hegde (Eds.), *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed., pp. 1–XX). CRC Press, Taylor & Francis. https://doi.org/10.1201/9781003501596

Kelele, K. G., Reddy, S. G., & Ananda Murthy, H. C. (2025). Chapter 22: Inorganic nanomaterials for capacitor applications. In H. C. Ananda Murthy, V. Subramaniam, M. Sillanpää, R. Balachandran, & G. Hegde (Eds.), *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed., pp. 1–XX). CRC Press, Taylor & Francis. https://doi.org/10.1201/9781003501596

Ripanda, A., Rwiza, M. J., Nyanza, E. C., Hossein, M., Ananda Murthy, H. C., & Machunda, R. L. (2025). Chapter 2: Inorganic nanomaterials for advanced environmental remediation—A paradigm shift in sustainable solutions. In H. C. Ananda Murthy, V. Subramaniam, M. Sillanpää, R. Balachandran, & G. Hegde (Eds.), *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed., pp. 1–XX). CRC Press, Taylor & Francis. https://doi.org/10.1201/9781003501596

Reddy, S. G., & Ananda Murthy, H. C. (2025). Chapter 17: Inorganic nanomaterials in drug delivery. In H. C. Ananda Murthy, V. Subramaniam, M. Sillanpää, R. Balachandran, & G. Hegde (Eds.), *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed., pp. 1–XX). CRC Press, Taylor & Francis. https://doi.org/10.1201/9781003501596

Surendra, B. S., Swamy, M. M., Reddy, S. G., & Ananda Murthy, H. C. (2025). Chapter 9: Inorganic nanomaterials for dye degradation application. In H. C. Ananda Murthy, V. Subramaniam, M. Sillanpää, R. Balachandran, & G. Hegde (Eds.), *Multifunctional inorganic nanomaterials: Synthesis, properties, and applications* (1st ed., pp. 1–XX). CRC Press, Taylor & Francis. https://doi.org/10.1201/9781003501596

Consultancy Reports

Ananda Murthy, H. C. (2023–2025). *Consultancy as international member for the Electrochromic Smart Windows (SmartWindow) project* [Industry research project report, Telecom Malaysia R&D Grant RDTC231080]. Telecom Malaysia R&D, Malaysia. Project Leader: Chan, K. Y. Project Value: RM 395,698 (≈ PGK 380,736).

Invited Talks/Keynotes

Ananda Murthy, H. C. (2025, January 17). *Cobalt oxide-based core–shell nanostructure: Synthesis and applications*. Paper presented at Reva University, Bengaluru, Karnataka, India.

Ananda Murthy, H. C. (2025, January 23–24). *Semiconducting nanostructures for sensing and catalytic dye degradation applications*. Paper presented at the International Conference – TFCMS, NMKRV College for Women, Bangalore, India.

Ananda Murthy, H. C. (2025, October). *Delivered two sessions and chaired sessions at the Workshop on Competitive Research Proposal Writing for National and International Grants*. TLMU and PSR&I, PNG University of Technology, Papua New Guinea.

Ananda Murthy, H. C. (2025, October). *Chaired technical sessions for postgraduate researchers*. PSR&I, PNG University of Technology, Papua New Guinea.

Patents

Surendra, B. S., Rudresh, Nagaswarupa, H. P., Uma, D., Ananda Murthy, H. C., Duke, D. N., Ramesh, R., & Bharath, M. J. (2025). *Development of cost-effective LaxZr2-xO7 NPs for heavy metal mercury detection by electrochemical sensor studies* (Indian Patent No. 202341047941). Patent Office, Intellectual Property of India, Government of India.

SCHOOL OF MATHEMATICS AND COMPUTER SCIENCE

Head of the School: Dr. Mohsen Aghaeiboorkheili

Introduction

The School of Mathematics and Computer Science (MCS) at the Papua New Guinea University of Technology (PNGUoT) plays a central role in advancing research, innovation, and capacity building in mathematics, computer science, and related interdisciplinary areas. In 2025, the school continued to strengthen its research profile through staff-led research, postgraduate supervision, industry collaboration, and the integration of research activities into undergraduate and postgraduate teaching. Research activities were aligned with national development priorities and PNGUoT's strategic focus on digital transformation, innovation, and applied problem-solving.

The school's research culture emphasizes applied and impact-driven research addressing real-world challenges in Papua New Guinea and the Pacific region. Key thematic areas include artificial intelligence, machine learning, cybersecurity, data analytics, applied and computational mathematics, health analytics, smart infrastructure, blockchain applications, and digital systems for governance and community development. These areas reflect the school's commitment to producing research that is both academically rigorous and socially relevant.

In 2025, MCS demonstrated strong research productivity, with multiple peer-reviewed journal publications, book chapters, and conference presentations by academic staff. Research outcomes were complemented by extensive student-led innovation, particularly through final-year undergraduate projects that addressed crime prevention, public health, education systems, agriculture, business automation, and infrastructure management. These projects contributed to community engagement while also strengthening students' research and professional skills.

Overall, the School of Mathematics and Computer Science continued to consolidate its role as a key contributor to PNGUoT's research mission, fostering collaboration with national and international partners and building a sustainable research ecosystem that supports staff development, student learning, and national capacity building.

Research Focus

During the 2025 reporting year, the research focus of the School of Mathematics and Computer Science centered on applied research and innovation with direct relevance to national development and industry needs. A major emphasis was placed on artificial intelligence, machine learning, and data analytics, particularly in areas such as cybersecurity, intelligent systems, predictive modeling, facial recognition, and network traffic analysis. These research efforts support PNG's digital transformation agenda and address emerging technological challenges.

Applied and computational mathematics formed another core research pillar, including dynamical systems, optimization, queuing theory, time series analysis, and mathematical modeling for engineering, transportation, healthcare, and environmental applications. Staff research in these areas contributed to improved understanding of traffic flow optimization, healthcare system analysis, and physical system modeling relevant to local contexts. Health and public safety analytics were also key focus areas, with research and student projects addressing disease outbreak prediction, medical system efficiency, and drug demand forecasting. In parallel, blockchain and distributed ledger technologies were explored for applications in land registration, aid transparency, property management, and secure digital governance.

The school also emphasized interdisciplinary and industry-engaged research through collaborations with organizations such as Bank of Papua New Guinea, DataCo, Oracle, Huawei, and international academic partners. Undergraduate and postgraduate research supervision played a critical role in embedding research into teaching, ensuring that students contribute to innovation while developing strong analytical and problem-solving skills.

Staff Profiles

Name	Designation	Research Expertise and Interests
Hasan Gumral	Professor	Geometric Mechanics, Finite Element Methods, Mathematical Physics, Advanced Applied Mathematical Modelling
Chris Wilkins	Senior Lecturer	Programming Languages, Statistics, Probability Modelling, Algorithms, Computational Problem Solving
John Lanta	Senior Lecturer	Differential Equations, Statistical Modelling, Algebraic Structures, Topological Groups and Rings
Mohsen Aghaeiboorkheili	Senior Lecturer / Head of School	Numerical Methods, PDES, Boundary Value Problems, Mathematical Modelling, Computational Mathematics, Data Analytics
Mansooreh Kazemilari	Senior Lecturer	Topological Network Analysis, Econometrics, Time Series Analysis, Social Network Analysis
Samuel Dunstan	Lecturer	Numerical Analysis, Scientific Computing, Computational Mathematics
Boaz Andrews	Lecturer	Statistics, Probability Theory, Boolean Algebra, Algebraic Systems in Informatics
Raymond Kuna	Lecturer	Mathematical Modelling, Differential Equations, Topological Algebraic Structures
Doris Benig	Lecturer	Statistical Modelling, Probability Methods, Applied Statistics
Cyril Sarsoruo	Lecturer	Functional Equations, Inequalities, Mathematical Modelling
Arun Kumar Singh	Associate Professor	IoT, Big Data, Computer Networks, AI, Machine Learning, HCI, Interdisciplinary Digital Systems
Benson Mirou	Senior Lecturer	Software Engineering, Computer Networks, E-Agriculture, Distributed Systems
Rajendran Bhojan	Lecturer	Big Data Mining, Cybersecurity, Network Intrusion Detection, Deep Learning
Lenz Nerit	Lecturer	Software Engineering, Reverse Engineering, Artificial Intelligence
Yaling Tapo	Lecturer	Computer Networks, Data Science, Applied Computing Systems
Peter Helebi	Lecturer	Big Data Analytics, Machine Learning, Predictive Modelling, AI
Nicholas Puy	Lecturer	Image Processing, Machine Learning, Deep Learning, IoT, Computer Vision

Undergraduate Student Projects (for BSCS students)

Student Name	Project Title	Supervisor/s
Azriel Gamiandu	*UniSafe Alert System*	Mr. Sankwi Abuzo
Elizah Tembe	*Online Criminal Reporting and Management System (OCRMS) for Lae City*	Mr. Yaling Tapo

Shima Denson	*Web-Based Citizen Reporting System for Lae City*	Mr. Yaling Tapo
Gideon Kombua	*Cyberthreat Intelligence Platform*	Dr. Rajendran Bhojan
Yamak Balthasar	*Comparing ML Algorithms in Land Use and Land Cover Classification*	Dr. Arun Singh
Nehemiah Pinia	*Customer Churn Prediction for Banks Using Machine Learning*	Mr. Yaling Tapo
Aaron Puia	*Blockchain Technology for PNG Digitization*	Dr. Chris Wilkins
Daniel Yatukoman	*PNG Aid Ledger*	Dr. Arun Singh
Ryan Bagah	*Face Recognition for Automated Attendance Tracking*	Dr. Benson Mirou
Clement Kulakee	*Forecasting TB Drug Demand Using Predictive Analytics*	Mr. Peter Helebi
Melton Sunu	*Disease Outbreak Prediction System for PNG*	Mr. Cyril Sarsoruo
Lisa Muri	*Online Clinic Appointment System*	Mr. Peter Helebi
Kobla Boi	*UNITECH DODL Student Assessment Grading System*	Mr. Nicholas Puy
Joshua Auti	*GPS and QR Code-Based Attendance Management System*	Dr. Arun Singh
Renee Attmankia	*Web-Based UNITECH Lecturers Evaluation System*	Mr. Sankwi Abuzo
Aaron Akis	*Jiwaka Province Tertiary Students Fee Assistance Web Application*	Dr. Chris Wilkins
Angela Wycliffe	*SRS Open Desk System*	Mr. Nicholas Puy
Cynderella Manda Kua	*MCS FYP Vault*	Mr. Nicholas Puy
Vivian Sepoe	*Web-Based Payslip System for Oil Palm Farmers in Higaturu*	Dr. Rajendran Bhojan
Jonah Koprik	*PNG Cocoa Farmers App*	Mr. Cyril Sarsoruo
Nadia Kila	*Appointment System for Salon SMEs in PNG*	Mr. Sankwi Abuzo
Peter Mendai	*KinaTrack: Mobile Book Keeping Application*	Dr. Benson Mirou
Herbert Gese	*PNG Analytica LIMS Phase 1*	Dr. Arun Singh
Jenitha Wale	*UNITECH Dorm Maintenance Request System (DormAID)*	Dr. Rajendran Bhojan
Noddy Hagayo	*MEHASA Hymnal App*	Dr. Benson Mirou
Elizah Barr	*Affiliate E-Commerce Website Using Weebly*	Dr. Benson Mirou

Seminars/Workshops/Symposium/Conference Organized

BRIDGES International Workshop on Software Engineering (2025) – An international, hybrid event hosted by the School of Mathematics and Computer Science, focusing on Software Engineering and Emerging Technologies. The workshop featured international speakers from Japan and enhanced research exposure for both staff and students.

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
University of Newcastle	Australia	Benchmarking and accreditation collaboration	In Progress	TBD	Curriculum alignment and accreditation preparation
NAIST Institute	Japan	Research collaboration, student internships and staff training	Ongoing	Ongoing	Student and staff research capacity building
Osaka University	Japan	Joint software engineering workshops and academic collaboration	Ongoing	Ongoing	International seminars and research exposure
Bank of Papua New Guinea (BPNG)	Papua New Guinea	Professional training and potential student work experience programs	Ongoing	Ongoing	MATLAB training and industry engagement
DataCo / Oracle Partnership	Papua New Guinea / International	Digital transformation, database and cloud computing training	Ongoing	Ongoing	Staff and student upskilling
Cisco / ITU Digital Training Centres	International	Digital literacy and community outreach training	Ongoing	Ongoing	Community digital training programs
Huawei Technologies	International	Student recruitment and industry exposure	Ongoing	Ongoing	Student employment pathways and industry engagement
PNG Analytica (School of Agriculture Collaboration)	Papua New Guinea	Student research collaboration (LIMS Project)	2025	Project-Based	Industry-linked student innovation

Research Outputs

Journal Articles

Hassani, K., Kolkoma, D., & Aghaeiboorkheili, M. (2025). Hemodynamics variations of umbilical vein and ductus venosus due to different material properties. *Inter-disciplinary Journal of Papua New Guinea University of Technology 2*(1): 58-66. https://doi.org/10.63900/zrez0m85

Kaliyaperumal, K., Bhojan, R., & Aghaeiboorkheili, M. (2025). Sophisticated machine learning methods for reliable network traffic data categorization models. *Inter-disciplinary Journal of Papua New Guinea University of Technology 2* (2): 144-152. https://doi.org/10.63900/cm3v2t81

Kaliyaperumal, K., Boddu, R. S. K., Oruganti, S. K., Kebesa, G. T., Aghaeiboorkheili, M., Bhojan, R., Salomi Victoria, D. R., & Kaliyaperumal, P. J. (2025). An efficient technique for identifying distributed denial of service active assaults using deep neural networks based on the adaptive system intelligence paradigm. *International Journal of Basic and Applied Sciences, 14*(2), 577–590. https://doi.org/10.14419/dwfxsc41

Kazemilari, M., & Aghaeiboorkheili, M. (2025). Evaluation of organizational commitment: A study using social network analysis. *Inter-disciplinary Journal of Papua New Guinea University of Technology 2*(1): 75-83. https://doi.org/10.63900/0nqhej11

Kiap, H., & Aghaeiboorkheili, M. (2025). The foundation of electromagnetism: A comprehensive study of Maxwell's equations. *African Journal of Mathematics and Statistics Studies, 8*(3), 113–124. https://doi.org/10.52589/AJMSS-DBSPWNNO

Palin, F., Mirou, B., & Aghaeiboorkheili, M. (2025). Analysis of healthcare system towards improvement. *African Journal of Mathematics and Statistics Studies, 8*(3), 125–135. https://doi.org/10.52589/AJMSS-DIIURPWZ

Poi, N., Jana, S. K., Nerit, L., Sekac, T., & Pai, A. (2025). WebGIS integrated information management system for effective administrative functions. *International Journal of Geoinformatics, 21*(6), 105–127. https://doi.org/10.52939/ijg.v21i6.4241

Rai, B., Mirou, B., Andrews, B., & Aghaeiboorkheili, M. (2025). Optimizing urban traffic flow in smart cities: An integrated queuing and dynamical systems approach. *Advanced Journal of Science, Technology and Engineering (AJSTE), 5*(2), 67-75. https://doi.org/10.52589/AJSTE-3NTHAYOI

Raimbas, D., & Aghaeiboorkheili, M. (2025). Impact and collision dynamics modeling and simulation for road safety in Papua New Guinea. *African Journal of Mathematics and Statistics Studies, 8*(3), 96–112. https://doi.org/10.52589/AJMSS-HPJPFBVW

Singh, A. K. (2025). Use of energy-efficient routing algorithms for green transportation. *DS Journal of Digital Science and Technology, 4*(1), 25–49. https://doi.org/10.59232/DST-V4I1P103

Singh, A. K. (2025). Comparative study of machine learning algorithms for facial recognition systems. *DS Journal of Digital Science and Technology, 4*(1), 50–62. https://doi.org/10.59232/DST-V4I1P104

Singh, A. K. (2025). Smart eco-friendly manufacturing system with AIoT applications. *Journal of Advances in Artificial Intelligence, 3*(2), 109–121. https://doi.org/10.18178/JAAI.2025.3.2.109-121

Book Chapters

Patra, A. K., & Singh, A. K. (2025). Role of smart sensor in Internet of Things for structural health monitoring of composite structures. In S. K. Jana, K. Muduli, I. Pal, & P. Meena (Eds.), *Artificial intelligence, geographic information systems, and multi-criteria decision-making for improving sustainable development* (1st ed., pp. 1–23). Auerbach Publications, Taylor and Francis Group

Singh, A. K. (2025). Fundamentals of data visualization and its applications in business. In M. A. Muniasamy, A. Naim, & A. Kumar (Eds.), *Data visualization tools for business applications* (pp. 1–28). Auerbach Publications, Taylor and Francis Group

Singh, A. K., & Patra, A. K. (2025). Pathways for sustainable development and multi-criteria decision-making using AI and GIS. In S. K. Jana, K. Muduli, I. Pal, & P. Meena (Eds.), *Artificial intelligence, geographic*

information systems, and multi-criteria decision-making for improving sustainable development (1st ed., pp. 1–17). Auerbach Publications, Taylor and Francis Group https://doi.org/10.1201/9781032683928

Conference Presentations/Seminars/Proceedings

Dawa, W., & Singh, A. K. (2025). Network automation with Python: A practical guide. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology.

Hassani, K., Kolkoma, D., & Aghaeiboorkheili, M. (2025, July 1–3). Modeling and mechanobiology of the mitral valve. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Kalan, S., & Bhojan, R. (2025). Leveraging data integration using APIs for enhanced data analytics in Papua New Guinea. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology.

Patra, A. K., & Singh, A. K. (2025). Experimental investigation on laminated wooden composites of selected Papua New Guinean woods for sustainable structures. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology.

Singh, A. K. (2025). Wireless computing in all areas: A mathematical approach. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology.

Singh, A. K., & Patra, A. K. (2025). Futuristic potential of frequency modulated continuous wave integrated photonic LiDAR in Pacific Islands infrastructure. Paper presented at the *GeoPNG Inaugural Congress*, Papua New Guinea University of Technology.

Singh, A. K., & Patra, A. K. (2025). Smart geospatial platforms: Enabling data-driven solutions for sustainability and resilience. Paper presented at the *GeoPNG Inaugural Congress*, Papua New Guinea University of Technology.

Yatukoman, D., & Singh, A. K. (2025). From suspicion to trust: ICP blockchain's role in PNG aid accountability. Paper presented at the *6th PIURN Conference*, Papua New Guinea University of Technology.

CENTRES OF RESEARCH EXCELLENCE

CENTRE OF EXCELLENCE FOR BIOTECHNOLOGY (CEB)

Director: Professor Tom Okpul

The Centre of Excellence for Biotechnology (CEB), formerly the Unitech Biotechnology Centre, was established by the Council of the Papua New Guinea (PNG) University of Technology (PNGUT) in 1997 in recognition of the immense role that modern biotechnology could play in contributing to national development. Although it operates under the auspice of the School of Agriculture (SOA), it reports to the Office of the Deputy Vice Chancellor.

Biotechnology is a powerful enabling technology, with applications that have the potential to revolutionize many industry sectors (including agriculture, forestry, fishing, pharmaceuticals and health, chemicals, textiles, food processing, environmental industries, energy, and mining). Appropriately, the current vision for the CEB that encompasses the nation's current developmental issues in the face of the changing climate is "to be leaders in the use of agricultural biotechnology to improve livelihoods". Hence, it strives to accomplish high quality research, training and development outcomes with an entrepreneurial characteristic that emphasizes the application of agricultural biotechnology in addressing issues associated with food and livestock production, forestry, and the environment in PNG.

While aligning to the university's strategic plan, our proactive support for the university's internationalization agenda has led us to forge partnerships with international and local institution and stakeholders that share our interest in collaborative research in agriculture and the biological sciences.

Research Focus

- Evaluation of promising rice varieties for PNG (Fig.1).
- Collection, conservation, and utilization of PNG taro germplasm for drought tolerance
- Chemistry and variations in taro starch and cellulose
- Development of fungal inoculum for artificial agar wood production in PNG
- Bio-prospecting of beneficial organisms for insect pest control in PNG
- Development of a maize seed system for climate change mitigation in PNG
- Collection, conservation, and utilization of PNG wild rice
- Genetic transformations of taro and rice
- Propagation of endemic orchids

First Unitech rice breeding lines

Mass propagation of PNG's own orchid, cv. Sepik blue in tissue culture. Inset: A bloom from a segregating progeny.

Staff Profiles

The staff collaborating with the CEB are listed.

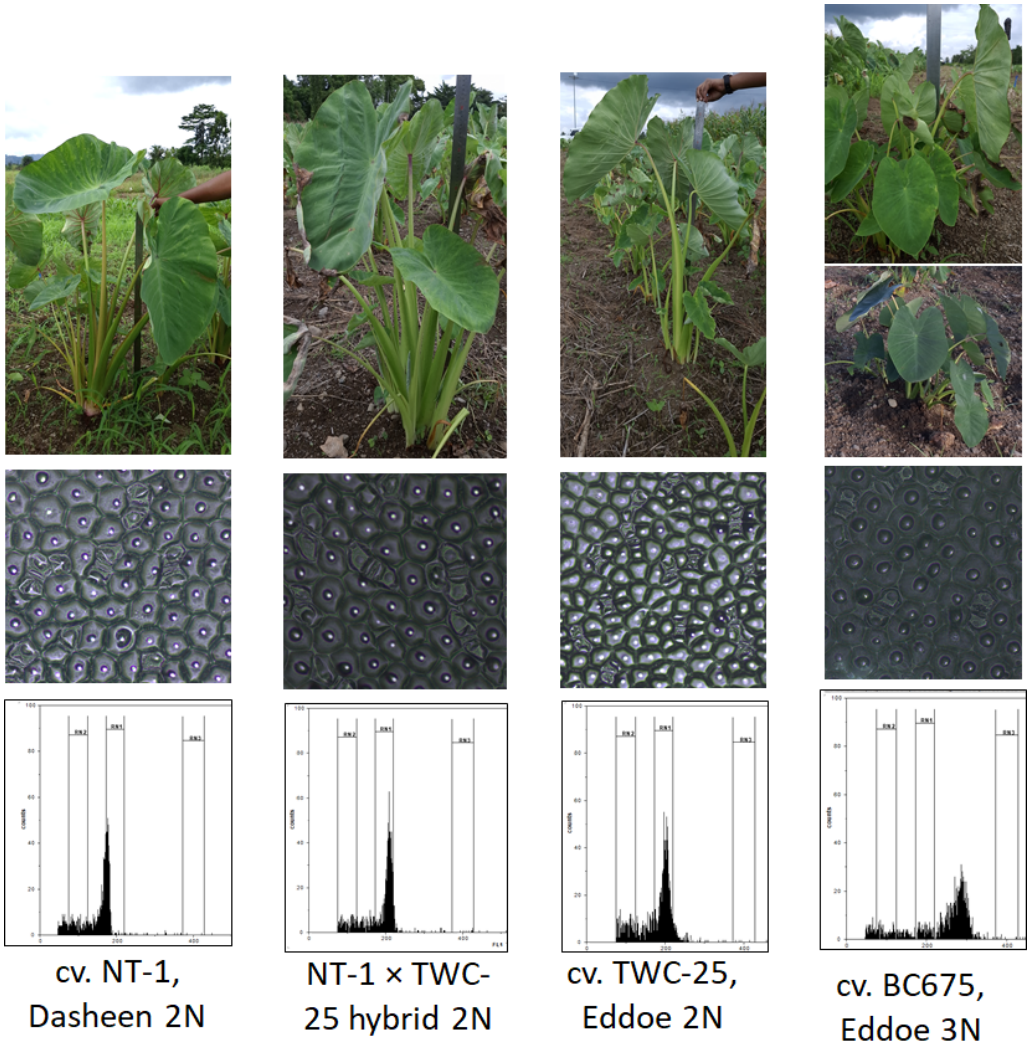
Name	School	Research Expertise and Interests
Prof. Macquin Maino	Agriculture	Plant pathology, nematology, plant viruses, biocontrol agents
Dr. Ronnie Dotaona	Agriculture	Agricultural entomology, integrated pest management, biocontrol agents
Dr. Gwendolyn Ban	Agriculture	Plant pathology, biocontrol agents
Dr. Spencer Poloma	Agriculture	Crop physiology, agronomy
Dr. David Timi	Applied Sciences	Organic chemistry
Dr. Jason Wau	Applied Sciences	Organic chemistry
Mrs. Totave Kamen	Principal Technical Officer	CEB, Laboratory operations

Research Highlights

Phylogenetic relationships among wild and cultivated rice germplasm.

The figure presented shows DNA-based phylogenetic analysis of wild rice germplasm maintained at CEB demonstrated significant genetic divergence between cultivated rice (UR1) and its wild relatives. This diversity highlights the importance of wild rice as a reservoir of adaptive traits that can be harnessed for crop improvement, particularly in response to climate change.

Determination of Ploidy Levels in Taro Germplasm and Hybrids



An integrated analysis combining stomatal observations and flow cytometry was used to determine ploidy levels in selected taro genotypes and their hybrid progeny. The results confirmed that both parental lines (NT-1 and TWC-25) and their hybrid are diploid (2N), whereas BC675 is triploid (3N). Differences in stomatal density and cell morphology were consistent with ploidy levels, demonstrating the reliability of these traits as supportive indicators. These findings are important for taro breeding, as ploidy variation influences traits such as vigor, yield potential, and adaptability.

Undergraduate Student Projects

As reported under the Schools of Agriculture and Applied Sciences.

Postgraduate Student Projects

Student name	Program	Project Title	Supervisor/s
Eko Maiguo	PhD in Agriculture	*On the Impact of Exotic Naturalized Trees in the Landscapes of Papua New Guinea: the Situation in Bulolo and Wau*	Prof. Tom Okpul Prof. Macquin Maino
Denano Sogoing	PhD in Appl. Sciences	*Ecological Risk Assessment of Markham River and its Tributaries: A Case Study in Relation to Heavy Metals Contamination and Phyto-remediation*	Dr. David Timi Prof Tom Okpul
Gure'ahafo Tumae	PhD in Agriculture	*Efficacy of Beauveria (Bals.-Criv.) (Hypocreales: Codycipitaceae) Isolates from Elevational Gradients on Coffee Berry Borer (CBB), Hypothenemus hampei (Ferrari) in Papua New Guinea.*	Dr. Dotaona Prof. Tom Okpul
Lisahpo Wawah	MSc in Agriculture	*Evaluating the Ploidy Level and Drought Tolerance of Dasheen × Eddoe Taro Hybrids*	Prof. Tom Okpul Dr. Bradley Campbell
Naomi S. Gomuna	MPhil in Agriculture	*A Comparative Analysis of Food Safety and Phytosanitary Measures for Importing PNG Taro into Australia, New Zealand, Japan and USA*	Prof. Tom Okpul
Godfrey Hannett	MSc in Agriculture	*Agro-morphological Characterization of the Galip Nut (Canarium indicum) Population Maintained at the NARI-Kerevat Arboretum, East New Britain Province*	Prof. Tom Okpul

Funded Staff Research and Development Projects

Project Title and Number:	*Enhancing Drought Tolerance and Food Security in Papua New Guinea: the Potential of New Taro Germplasm* (ACIAR CROP-2023-194)
Funding Source (External): If external, specify.	Australian Centre for International Agriculture: Small Research Activity
Project Duration:	3 Years
Funding Amount:	K811,851.91 (AU$267,539)
Project Team:	Dr. Millicent Smith, Dr. Bradley Campbell, Prof. Tom Okpul, Professor Ian Godwin
Outputs, Outcomes and Key impacts:	• Generate new germplasm from crossing eddoe X dasheen taro types; • Determine ploidy levels of local eddoe-type taros; • Conduct farmer-participatory evaluation and selection for drought tolerant taro lines; • Assess their extent of genetic diversity by phenotyping, and genotyping by sequencing (DArT and SNP).
Project Title and Number:	*Collection and Conservation of PNG Wild Rice*
Funding Source (External): If external, specify.	Trukai Industries Ltd
Project Duration:	1 Years
Funding Amount:	K20,000.00
Project Team:	Prof. Tom Okpul

Outputs, Outcomes and Key impacts:	• Collect wild rice species from the wild; • Maintain then *ex situ* and characterize and identify them; • Assess their extent of genetic diversity by phenotyping, and genotyping by sequencing (DArT and SNP).

Students posing after a practical class on taro breeding

Memberships and Affiliations with National and International Research Organizations

Name	Membership Type	Organization/Professional Association	Country	Period
Tom Okpul	Membership	*Global wild rice germplasm resources conservation alliance* -National Nanfan Research Institute, Sanya, Chinese Academy of Agricultural Sciences	China	2025 -

Collaborations and Memorandum of Understandings

Partner Institution	Country	Purpose of MoU	Date Signed	Validity Period	Key Outcomes
Trukai Rice Industries Ltd	Papua New Guinea	Joint training of rice farmers for irrigated rice farming; funding for student scholarships and rice research	12 Oct 2022	2022–2027	1. Conduct two training sessions per year 2. Provide scholarships for three postgraduate (Masters) students biennially

					3. Provide annual support funding for staff research
The University of Queensland	Australia	Joint research and capacity building under ACIAR CROP-2023-194	15 Nov 2023	2023–2026	1. Collect local eddoe-type taros and preferred dasheen-type varieties and hybridize (2024) 2. Determine ploidy levels of eddoe-type taros (by 2025) 3. Raise progenies and conduct participatory selection with farmers (2025–2026)
Chongqing Normal University	China	Development of Rice Research Centre	7 Nov 2025	2025–2030	Signing of the MoU
National Nanfan Research (Sanya)	China	Wild rice research and development	30 June 2025	2025–2028	Signing of the MoU

Research Outputs

Journal Articles

Danbaro, G., Ssemugenyi, F., & Okpul, T. (2025). Predictive validity of the special tertiary admission test in Papua New Guinea. *International Journal of Education and Practice, 13*(3), 1022–1031. https://doi.org/10.18488/61.v13i3.4356

Conference Presentations/Proceedings

Gomuna N. & Okpul T. (2025, 1-3 July). Access of Papua New Guinea Frozen Taro. [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network, Papua New Guinea University of Technology, Lae.

Hannett G., Leonard K., Wallace H., Okpul T. (2025, 1-3 July). An analysis of genetic variation among Galip nut (*Canarium indicum*) accessions from four Islands of Papua New Guinea. [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network, Papua New Guinea University of Technology, Lae.

Maiguo E., Maino M., Okpul T. (2025, 1-3 July). On the impact of exotic naturalized trees in the landscapes of Papua New Guinea: the situation in Bulolo and Wau. [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network, Papua New Guinea University of Technology, Lae.

Wawah L., Warendo M., Campbell B., Okpul T. (2025, 1-3 July). Variations of ploidy levels among taros in Papua New Guinea. [Conference presentation abstract]. 6th Pacific Islands Universities Regional Network, Papua New Guinea University of Technology, Lae.

Okpul, T., Poiya, C., Caleb, C., Pamaraka, F., Kabiwaga, M., Bugajim, C., Manus, R., Buyoyu, P. & Janet Paofa. (2025, 7 -13th December). Wild Relatives of the rice plant in Papua New Guinea. Paper presented at the 2025 Wild Rice Germplasm Collection & Characterization Workshop, National Nanfan Research Institute, Sanya, China. See Fig. 4.

Wawah, L, Restall, J., Campbell, B., Smith, M., Godwin, I. & Okpul, T. (2025, 11-13 November). Cytological, genetic and morphological evaluation of intraspecific hybrids between botanical variants *Colocasia esculenta* var. *esculenta* and *C. esculenta* var. *antiquorum*. TropAg International Agriculture Conference, Royal International Conference Centre, Brisbane, Australia.

Consultancy Reports

Okpul, T. (2024). *Multiplication and distribution of open-pollinated corn seed to enhance farmer resilience*. Australia Papua New Guinea Economic Partnership Program, Port Moresby.

CENTRE OF EXCELLENCE IN ENVIRONMENTAL RESEARCH (CoEER)

Director: Dr. Patrick S. Michael

Introduction

The Environmental Research and Management Centre (ERMC) was established in 1993 and, in 2025, was renamed to the Centre of Excellence in Environmental Research (CoEER) by the current board. The name change was needed to accommodate the mandated roles and responsibilities of the CoEER in environmental research, focusing on environmental sustainability and sustainable use of natural resources with minimal negative impacts. Sustainable use and management of natural resources are impossible when the general environment is adversely impacted. Therefore, most research focuses on understanding the management of degraded environments using environment-friendly techniques and strategies. Most of these are underpinned by climate change and environmental sustainability. The management component includes contributions to policy and plan, e.g., biodiversity conservation, protected area establishment, regulation and control, monitoring and risk management, biosecurity and transboundary movement, and border surveillance. Developing regulatory frameworks for proper administration and management of the environment and natural resources towards benefit sharing, capacity building, research and development, and conservation and management underpin the overall research responsibilities of CoEER.

Research and Development

In line with the renaming of the center and the PNGUoT Strategic Plan 2025 – 2029, the CoEER has developed an implementation plan 2025 – 2029 covering Three Strategic Initiatives: A reputable center of excellence for research, research is solution-driven and dynamic culture of scholarly publications. These three strategic initiatives were used to develop the strategic objectives, goals, and actions for the planning period. More so, a very strong board, with representation from the faculty of natural resources, engineering, sciences, built environment, and humanities, was formed with a self-explanatory term of reference. This is a significant initiative to provide CoEER with strategic direction and oversight on the implementation of the strategy in the best interest of the University. Additionally, pooling technical expertise from various schools forming the Working Research Group provides CoEER with the leverage and strength needed to do multi-disciplinary research and promote R&D.

Current Research Projects

A number of significant projects ongoing are:

(i) Certificate II in Project Planning and Management – The syllabus of this course has been written in consultation with Global Green Growth Institute (GGGI) and Climate Change and Development Authority (CCDA). Thirty-five students have been sponsored by GGGI and the course is taught online by staff of CoEER, Civil Engineering and Mechanical Engineering. Ten have successfully completed the course and certificates issued. K70,000.00 total funding.

(ii) The PNGRIS2 – The PNG Resource Information System 2 (soil) project with ACIAR is in its third year and staff from CoEER, Agriculture and Surveying and Land Studies are involved. This is a team project and Director of CoEER is the team leader of the PNGUoT team. The project will end in December 2026. Over K600,000.00 total funding.

(iii) Project examining climate impact in PNG with Climate and Security Policy Centre at the Australian Strategic Policy Institute (Climate and Security Policy Centre, Australian Strategic Policy Institute (ASPI.) In partnership with ASPI, a concept paper was written for development and ongoing.

(iv) Climate change, sustainable energy, and nuclear safety – This is an EU project at its very early stage. A table of Partners Form was filled and sent with the CV of the Director and ongoing.

(v) Irrigation and mechanisation of sweet potato production in PNG – opportunities and limitations. CoEER and NARI have partnered with the University of Queensland to develop the concept notes, and submitted to ACIAR for consideration.

(vi) Improved sweet potato production management project – This project has advanced and further discussion with leaders from ACIAR and CSIRO are ongoing.

(vii) New Guinea Islands Cocoa Project – This is an ACIAR project where the first component has been completed, but CoEER will be involved in several studies in the second component. Initial discussions have been held, and more direct involvement will occur as the second component of the project kick start in 2025.

(viii) Development of stereo-intelligent agricultural ecosystem monitoring system and its application with Yantai Institute of Coastal Research, Chinese Academy of Science, China. This project has reached the advanced stages and the Chinese team are seeking funding from their end, ongoing.

(ix) A targeted and structured genetic and agronomic traits improvement approach for winged bean to contribute to food and nutritional security in PNG under climate change. APEP has funded K110,000.00 and the research is into full agronomic trial.

(x) Capacity building in the higher education sector (EU-FCCB) – The working document written has resulted in a number of students fully funded for master's study at K200,000.00 a student. Two student proposals from CoEER have been awarded funds, one for K200,000.00 and another for K50,000.00. The third student was sponsored for K200,000.00 and will be co-supervised with a colleague from the School of Agriculture.

(xi) The effects of climate change on the altitudinal shift of lowland crops into the highlands of Papua New Guinea: An investigation into the changes in agroclimatic conditions causing the altitudinal growth of lowland crops along the Okuk Highway – Pacific Development Research Grants, New Zealand & PNGSTS. Proposed total funding of K100,000.00 as a PhD project.

(xii) Turtle conservation project with Wafi Golfu – Discussion has advanced and arrangement for site visit in place, including training for students. Wafi Golfu, UPNG and CoEER are working on the project and is ongoing.

(xiii) Managlas (Oro Province) Plateau Forest Climate and Biodiversity Project Funded by EU – CoEER is in the final states of discussion with the Project Management team to engage students (postgraduate studies and undergraduate field practice). At this stage, students from the Department of Agriculture and Forestry are targeted. Two students for master's study have been endorsed for 2026 academic year.

(xiv) Central Cassava Farming Project with PNG Hydro Development Limited (Chinese Company) – CoEER has been approached in 2023 initial inputs on the crop suitability assessment and following that, the company has visited again to develop an MOU for further involvement and student training. This is an ongoing project.

(xv) Carbon Trade Project with PNG IPA and an investor from Dubai under the Green Climate Initiatives – This project has started in partnership with PNG IPA and the investor, initially working in the Woodlark Island, Milne Bay. This is an ongoing project.

(xvi) Capacity building in the field of higher education (ERASMUS-EDU-2024-CBHE – Over a million-kina worth of laboratory equipment submitted. Partner has resubmitted the proposal to EU in 2025.

Proposals for Funding Submitted in 2025

(i) JICA PIM – PNGUoT Training Program – K246,685.00 proposal and budget submitted to Embassy of Japan, Port Moresby, and under consideration.
(ii) Small Grant Application for US Embassy Port Moresby – US$50,000.00 proposal submitted. Proposal for environmental research and under consideration.
(iii) Expression of interest – SC125073 PNG: Scoping Assessment for Building Resilience to Climate Change Phase 2 – Climate Application Specialist and Team Leader. Asian Development Bank (ABD).
(iv) PNG Fresh Food Marketing System – Sanitary and Phytosanitary Systems (ADB). Proposal Questionnaire submitted (ongoing). Equipment supports for schools.
(v) More than ten student project proposals submitted to EU-FCCB Scholarship for 2026. Proposals for master's student scholarships.
(vi) National Geographic Society – Building Resilience in Agriculture RFP
(vii) PNG Science and Technology Secretariat – PhD Research Proposal
(viii) Global Centre on Biodiversity for Climate Research Grant Competition 3, 2026.

Postgraduate Student Projects

A number of postgraduate student projects supervised by the Director, CoEER either in the final stages or ongoing are listed in Table below.

Name (Program)	Project Titles
Shirelyna Aipa (MPhil)	*Evaluating the Roles of Organic Matter Application on Soil Fertility Under Cocoa and Crop Productivity Under Humid Lowland Agroclimatic Conditions in Papua New Guinea*
Veronica Homband (MSc)	*The Role of Organic Matter of Varying Nutrient Content on Soil Fertility and Yield of Corn Under Humid Lowland Conditions in PNG*
Natanya Alfred (MSc)	*Investigating the Effects of Organic Matter of Varying Nutrient Contents on Rooting and Tuber Formation of Wined Bean*
Paulus Kop (MPhi)	*Effects of Balsa Plants on Soil Physiochemical Properties and Carbon Sequestration Potential in the Gazelle Peninsula, ENBP*
Jonah Anton (MPhil)	*Exploring the Diversity of Marita in Various Agro-Ecological Zones in the Highlands and Momase in PNG Based on Morphological and Physio-Chemical Characteristics*
Noelyne Fandim (MPhil)	*Assessing the Effects of Climate Change on Storage Pests Under PNG Lowland Conditions*
Kiole Imale (MPhil)	*An Assessment of How Alien Plants Establish Themselves in Ecological Succession of Tropical Rainforest: An Experimental Test in Papua New Guinea*
Penuel Togonawe (MPhil)	*Investigating into Sustainable Production of Arabica Coffee in the Higher Altitude of Madang, Madang Province*
Alice Pokon (MPhil)	*Assessing the Feasibility of Enzyme-treated Coffee Pulp as a Nutritional Supplement in Weaner Pig Feed*

Undergraduate Projects

The undergraduate students from the School of Agriculture who are undertaking research projects with the CoEER are listed below:

Names of students	Titles of the projects under taken
Stanford Dupi	*Investigating the Effects of Organic Matter of High Carbon Content on Rooting and Tuber Formation of Winged Bean*
Peter Nanu	*Investigating the Combined Effects of Organic Matter with High Carbon and Nitrogen Content on Soil Chemistry and Winged Bean Biomass Production*
Eunice Huas	*Investigating the Effects of Organic Matter (Sheep and Goat Manure) on Selected Soil Properties and Biomass Production of Winged Bean*

Memorandum of Understanding

The Centre has begun to establish a number of MOUs to pave pathways to enhance collaborative research as follows:

(i) Ramu Nico Company – Signed, supported K50,000.00 for 50th Anniversary celebrations. Supporting industrial training for various schools and equipment for labs including CoEER. The purpose is for CoEER to do collaborative research.
(ii) YUS Tree Kangaroo conservation and research – CoEER has drafted the MOU with the support of the University Lawyer and is with YUS for their input. Will be signed in 2026. The purpose is for CoEER to work with YUS on tree kangaroo research.
(iii) Climate Change Development Authority – MOU to be drafted by CCDA, 2026.
(iv) Yangzhou University – China

Research Outputs

Journal Articles

Michael, P. S., Rob, R., & Fitzpatrick, R. (2025). The roots of common terrestrial and aquatic plants can mitigate stresses of acid sulfate soils under varying moisture regimes. *Annals of Tropical Research, 47*, 32–44.

Conference Papers

Anton, J., Amben, S., Ahizo, J., & Michael, P. S. (2025, July 1–3). A comparative assessment of marita (*Pandanus conoideus*) production challenges and opportunities for further research and development in Papua New Guinea: A review. *6th Pacific Islands Universities Regional Network Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Aipa, S., & Michael, P. S. (2025, October 1–3). Assessing the importance of organic matter application in old cocoa plantation soil to manage soil fertility and yield responses of cocoa under tropical lowland agroclimatic conditions in Papua New Guinea. *PNG University of Technology Annual Postgraduate Seminar*, Lae, Papua New Guinea.

Michael, P. S. (2025, October 1–3). A targeted and structured agronomic and genetic traits improvement approach for winged bean production to contribute to food and nutritional security in Papua New Guinea under climate change. *3rd PNG Climate Summit*, Hilton Hotel, Port Moresby, Papua New Guinea.

Michael, P. S. (2025, July 1–3). The roles of cogon grass biochar in soil fertility management and sweet potato tissue composition of nutrients under humid lowland tropical agroclimatic conditions. *6th Pacific Islands Universities Regional Network Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

Michael, P. S. (2025, December 3–8). The PNG University of Technology – Who we are? *1st Yangzhou University–Pacific Island Countries Strategic Academic Symposium*, Yangzhou University, China.

Peter, T., & Michael, P. S. (2025, October 1–3). The effects of organic matter of legume origin on soil chemistry of composted mounds under sweet potato production in Papua New Guinea. *3rd PNG Climate Summit*, Hilton Hotel, Port Moresby, Papua New Guinea.

Topas, P., & Michael, P. S. (2025, July 1–3). The roles of organic matter of varying nutrient content used as amendment in composted mounds on sweet potato tissue accumulation of micronutrients. *6th Pacific Islands Universities Regional Network Conference*, Papua New Guinea University of Technology, Lae, Papua New Guinea.

WEEKLY RESEARCH SEMINAR


Left to right: Loop reactor, solar reactors and essential-oil utilization (with Jayson Wau, PNGUoT staff; PC: M. Oelgemöller)

TABLE OF ABSTRACTS

Influence of Experimental Loading Rate and Fabrication on Synthetic Fiber Reinforced Polymeric Skin of Advanced Composite

Alak Kumar Patra*, Jeshma Kepou, & Mirzi Betasolo

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Lae, Morobe Province, Papua New Guinea

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Abstract

This study investigates the influence of experimental loading rate and fabrication methodology on the mechanical behavior of synthetic fiber reinforced polymeric skins of advanced composites. Samples were fabricated using hand lay-up and vacuum-assisted resin transfer molding (VARTM) methods, with multidirectional fiber mats and epoxy resin. Tensile tests were conducted along 0°, 45°, and 90° relative to the longitudinal direction at varying loading rates (1.9 mm/min, 2.4 mm/min, and 4.8 mm/min). The ultimate tensile strength, Poisson's ratio, and modulus of rigidity were measured. The VARTM-fabricated specimens demonstrated higher tensile modulus along both weft and warp directions at a loading rate of 1.9 mm/min compared to hand lay-up specimens. Increasing the loading rate slightly improved stiffness along the weft direction in VARTM specimens, while variations along the warp direction and in major Poisson's ratios were minimal. The maximum relative standard deviation for tensile stiffness along the weft was 4.82%. These findings highlight the effects of fabrication technique and loading rate on the mechanical performance of advanced composite skins.

Keywords: Advanced composite, fiber reinforced polymer, VARTM, hand lay-up, tensile modulus, Poisson's ratio

Living with Radiation: A Comparative Health Impact Evaluation in High Background Radiation Areas in India and Normal Regions in Papua New Guinea

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Abstract

Natural environmental radiation is always present and can't be avoided; it usually happens at low levels. But being around high levels of radiation for a long time can be bad for your health. In some places, the levels of natural radiation are higher than normal because there are radioactive materials like uranium, thorium, radon, and thoron in the soil. To lower the risks to public health, it is important to control exposure to these dangers. Radon and thoron, as well as their offspring, are known to be indoor air pollutants that can raise the risk of lung cancer with long-term exposure, even at low levels. The southern coastal areas of Kerala, India, have a lot of natural background radiation because of the thorium-rich monazite sands. Higher levels of radiation may make it easier for radionuclides to get into the body through air, water, and food, which could lead to cancer. Reports also link this exposure to birth defects and chromosomal changes caused by ionizing radiation. Nevertheless, epidemiological data do not consistently demonstrate unequivocal negative health impacts at low doses. Some studies indicate adaptive biological responses, encompassing enhanced cellular regulatory mechanisms. This

research juxtaposes ambient radiation levels in India's high background radiation regions with those in Lae, Papua New Guinea, characterized by standard levels. The contrast presents an opportunity to investigate the long-term health effects of low-dose radiation and the potential genetic and biological adaptations in affected populations.

Keywords: High background radiation; health impact; natural radiation; congenital malformations; India; Papua New Guinea

Measurements and Analysis of Coastal Currents Along the Coast of Oman

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Abstract
Coastal currents play an important role in hydrodynamic transport processes along coastlines. Increasing environmental challenges caused by anthropogenic coastal pollution necessitate continuous monitoring of coastal hydrodynamic parameters using appropriate instrumentation. In this study, field measurements of waves and currents were conducted along the coast of Oman between 2017 and 2019 at eight coastal locations using Acoustic Doppler Current Profilers (ADCPs). At each site, hydrodynamic data were collected for at least two months in each season (summer and winter). In addition, the coastal region of Muscat, the capital of Oman, was modelled using Delft3D to better understand local hydrodynamic processes. Model calibration and validation were performed using measured data on water surface elevation and currents. The sensitivity of three turbulence closure models—k–ε, k–L, and an algebraic model—was evaluated using field data from ADCP deployments at three locations near Muscat. The model showed good agreement with observed water surface elevations and depth-averaged current magnitudes. However, further refinement is required to improve three-dimensional (3D) model predictions. The findings of this study provide a scientific basis for establishing a permanent coastal hydrodynamic monitoring system, which can support public authorities in mitigating coastal challenges such as pollution and erosion along the coast of Oman.

Keywords: Coastal currents; hydrodynamics; ADCP; Delft3D; turbulence models; coastal monitoring; Oman

Importance of Research on Low-Environmental-Impact Concrete as Next-Generation Building Material

Mohammed Abdul Mannan*

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Abstract
The construction industry urgently needs sustainable alternatives to conventional cement, which contributes 6–8% of global CO_2 emissions. Geopolymer concrete, produced from industrial and agricultural wastes such as fly ash and rice husk ash, offers a promising solution by reducing emissions by up to 66%, minimizing waste, and conserving natural resources. However, challenges remain, including the high carbon footprint of commercial alkaline activators and the lack of standardized production methods. This seminar explores laboratory-based

innovations, including hydrothermal processes for developing sustainable activators from waste materials, and highlights the importance of Life Cycle Assessment (LCA) to validate environmental benefits. Collaboration among researchers, industry professionals, and policymakers is essential to scale up geopolymer technology. By optimizing materials, reducing costs, and establishing clear standards, geopolymers can revolutionize construction and align with global sustainability goals. Key strategies include pilot projects, efficient waste utilization, and policy advocacy to mainstream these eco-friendly solutions. Together, these efforts can significantly lower the environmental impact of the construction industry while building durable and resilient infrastructure for the future.

Keywords: Life Cycle Assessment; geopolymers; green technology

A Water Balance Assessment of the Drying Trend of Groundwater-Dependent Lake Haramaya and the Potential Role of Soil and Water Conservation in Its Restoration

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Abstract
Lakes in dry and semi-arid regions, particularly those dependent on groundwater, are at risk of shrinking or disappearing due to human activities and climate change. Papua New Guinea, like Ethiopia, is experiencing water stress, and this study provides a benchmark for assessing similar conditions in PNG soils. Focusing on Lake Haramaya in Ethiopia's East Hararge region, which has experienced significant water-level decline, this study examines the geographical and temporal dynamics of surface and groundwater resources in the sub-basin, and evaluates the effects of soil and water conservation (SWC) practices on water infiltration, soil moisture retention, and surface runoff. Using the WetSpass model to assess water balance components, the study reports a mean annual evapotranspiration of 473.97 mm, surface runoff of 257.7 mm, and a low groundwater recharge of 17.15 mm, representing only 2.5% of total precipitation. These results indicate that a large fraction of precipitation is lost to evapotranspiration (69%) and surface runoff (26.8%), leaving insufficient water percolation to recharge the groundwater system sustaining Lake Haramaya. Understanding these water balance dynamics and the impact of SWC interventions is critical for designing targeted strategies to enhance groundwater recharge and support the restoration of this vital ecosystem.

Keywords: Surface runoff; Groundwater recharge; WetSpass; Lake Haramaya; Soil and water conservation; Lake restoration.

Public Transport Operations in Developing Countries

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Abstract
In many Indonesian cities, urban public transport services are provided by private operators using small vehicles with seating capacities of 10–16 passengers. These vehicles are operated by drivers as independent contractors,

who aim to maximize personal profit. Public transport operations are highly regulated, including route designation, fleet size, and fare structures. However, fleet size ceilings are often set too high and are almost always fully met on each route, despite limited-service demand. This imbalance prevents drivers from generating sufficient revenue to cover operating costs, prompting fare increase demands that could be avoided with better fleet management. Surveys conducted in Bandar Lampung, Lampung Province, included service frequency observations at bus terminals, onboard passenger counts, and visits to relevant authorities. Analysis indicates that, on average, buses make a limited number of trips per day, carry a limited number of passengers, and generate daily income just sufficient to cover operating expenses.

Keywords: Public transport, Urban transport, Fleet management, Developing countries, Bus operations, Transportation policy

The Implementation of IFRS 16 in Branded and Non-Branded Hotels in Papua New Guinea: A Comparative Study

Viswanadham Nadiminti* & Jabez Sam

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Abstract

This study investigates the implementation of IFRS 16 in branded and non-branded hotels in Lae, Papua New Guinea. Ten hotels, including five branded and five non-branded, were surveyed to assess compliance, operational impacts, and financial reporting implications of the standard, which modifies lease accounting practices. The research highlights differences in adoption: non-branded hotels face challenges due to limited resources and operational constraints, whereas branded hotels demonstrate better adherence through centralized management and greater resource availability. IFRS 16 replaces IAS 17 by capitalizing all leases, enhancing transparency, comparability, and financial accuracy. The findings show that implementing IFRS 16 affects financial ratios, including debt levels and EBITDA, and improves operational efficiency and financial visibility. The study underscores the significance of compliance for strategic decision-making and competitive advantage in the hospitality sector.

Keywords: IFRS 16, International Financial Reporting Standards, hotel management, financial reporting, branded vs. non-branded

Corporate Governance Practices and Management Accounting Information in the Decision-Making Process of Manufacturing Companies in Lae

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Abstract

Company performance depends on the quality of decisions made regarding socioeconomic factors, particularly the costs and benefits influencing the application of management accounting techniques. This study assesses the use and application of management accounting techniques from both local and international perspectives, and examines how they influence decision-making in the manufacturing sector. It further investigates the relationship between corporate governance mechanisms—such as regulatory compliance, audit committees, and board composition—and the financial performance of manufacturing firms. Grounded in agency theory, the study explores the relationship between shareholders and management to identify governance challenges within the manufacturing industry. Businesses in Papua New Guinea employ various accounting techniques, including overhead costing, marginal costing, breakeven analysis, capital appraisal techniques, standard costing, budgetary control, ratio analysis, and inventory costing. Data were collected from 35 manufacturing companies, including SMEs in Lae city, using a structured questionnaire, alongside secondary data from relevant documents. A mixed-methods approach combining qualitative and quantitative analyses was adopted. The findings reveal that major impediments to effective corporate governance include an inadequate legislative framework, inconsistent application of governance procedures, and a lack of qualified independent directors. These challenges reduce the effectiveness of governance practices and limit the potential for improved financial performance at the industry level. Comparative analysis of firms with strong and weak governance systems may further enhance understanding of these dynamics.

Keywords: Management accounting; decision-making; accounting information; corporate governance

Taro for Tomorrow: A New System to Screen for Salt Tolerance

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Abstract

Taro (*Colocasia esculenta*) has historically received limited breeding investment and remains vulnerable to climate change. In the Pacific, production is increasingly threatened by salinisation caused by rising sea levels, shifting water tables, and more frequent coastal inundation events. To address this, we developed a high-throughput, cost-effective, and size-adjustable phenotyping system to screen taro for salinity tolerance. Traditional stress screening methods often face challenges in scalability, consistency, and suitability for vegetatively propagated crops. Our system overcomes these limitations using readily available materials to simulate salinity stress through tidal-like brackish water cycles, while accommodating farmer-preferred planting material. It enables precise monitoring of both above- and below-ground physiological traits and provides a transferable

model for other vegetatively propagated crops. When combined with DNA fingerprinting of cultivated and wild taro accessions, this approach can identify genotypes with promising salt-tolerance traits, supporting resilient food systems under changing climatic conditions.

Keywords: Taro, salinity tolerance, phenotyping, climate resilience, vegetatively propagated crops

Effective Communication

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Abstract

Effective communication is the process of sharing information, ideas, thoughts, and feelings with other people or groups. It is very important in personal, academic, and professional settings. It makes it easier to share information, helps people make decisions and solve problems, and helps people work together and build relationships. The communication process is a cycle that starts with a sender who sends the message, then the message itself, then the channel through which it is sent, then the receiver who interprets it, and finally feedback that completes the process. There are many ways to communicate, such as intrapersonal (within oneself), interpersonal (between people), group, mass, and digital communication through electronic platforms. It can be spoken or written, or it can be nonverbal, which includes signs, symbols, kinesics (gestures and facial expressions), haptics (touch), and body language as a whole. Paralinguistic features like pitch, tone, volume, intonation, and speech speed also affect how messages are sent and understood. But there are many things that can make communication less effective, such as mechanical problems like noise or bad connections, language differences, social and cultural factors, and people's own feelings or attitudes. Even with these problems, good communication is still very important because it helps people understand each other, work together, trust each other, be more productive, and make informed decisions.

Keywords: Communication cycle; digital communications; nonverbal communication

Technology-Enhanced Learning: Is It the "Technology" or the "Learning" That Matters? Moving Towards a Balanced E-Learning Approach

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Abstract

Although the importance of technology in teaching and learning processes cannot be overemphasized, the debate on whether online educators are capable of guiding learning from foundational cognitive levels—such as remembering and understanding—to more complex tasks, including analyzing, evaluating, and creating

knowledge, remains ongoing. Motivated by this debate, this study re-evaluates the state of online education at the Papua New Guinea University of Technology (PNGUoT), with a focus on balancing the roles of technology and learning to enhance e-learning experiences. Using interactive inquiry and observational techniques as primary data collection methods, three major findings emerged: (1) both technology and learning are critical components of education; however, technology serves as an aid and does not substitute for or extend into learning itself; (2) online learning requires the adoption of new pedagogical approaches and epistemological frameworks; and (3) digital technology will continue to shape teaching and learning, regardless of the degree of its acceptance. The study concludes that positioning technology against learning represents a false dichotomy. Instead, the real challenge lies in the limited expertise required to critically evaluate and effectively integrate technology as an enabler of meaningful learning.

Keywords: Technology-enhanced learning; e-learning; pedagogy; digital education; higher education

ALLOCATION OF RESEARCH AND CONFERENCE FUNDS

Concise Summary of the Research and Conference Funding Overview for 2025

In 2025, total funding reached K812,256.48, with 93% (K756,686.91) allocated to research and 7% (K55,569.57) to conference participation. Research funding nearly doubled from K391,023.25 in 2024 to K756,686.91 in 2025, marking a 93.5% increase, showcasing a strong institutional focus on enhancing research capacity of the postgraduate students and removing financial barriers for the conduct of the student research.
PSR&ICs funding supported 38 research projects, primarily involving postgraduate students, emphasizing the development of postgraduate research skills. Additionally, 4 conference attendance applications of staff and staff on PG training were approved to aid in sharing research findings, establishing networks and boosting the university's research profile nationally and internationally.

Meeting Nos.	# of conference awards	Conference funding (PGK)	# of research funding awards	Research funding (PGK)	Total of conferences and research funding (PGK)
PSR&IC No. 19	-	-	6	235,416.32	235,416.32
PSR&IC No. 20	1	8,945.00	12	177,450.00	186,395.00
PSR&IC No. 21	-	-	9	159,259.89	159,259.89
PSR&IC No. 22	-	-	3	38,601.27	38,601.27
PSR&IC No. 23	4*	46,624.57*	8	145,959.43	192,584.00
Total	5	55,569.57	38	756,686.91	**812,256.48**

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