

**PNG UNIVERSITIES REVIEW**

**REPORT TO PRIME MINISTERS SOMARE AND RUDD**

Prepared By:

Professor Ross Garnaut

and

Sir Rabbie Namaliu

May 2010

## ACKNOWLEDGEMENTS

We are pleased to have been asked by the Prime Minister of Papua New Guinea, the Rt. Hon Grand Chief Sir Michael Somare, and the Prime Minister of Australia, the Hon Kevin Rudd, to review the Papua New Guinea universities and to make recommendations on how they might be strengthened to make their necessary contributions to Papua New Guinea development. The two Prime Ministers demonstrated their personal interest in the Papua New Guinea universities, encouraged us in our work at each stage, and ensured that we had the resources to undertake a large task in a short time. The Chief spent many hours with us, at the beginning, middle and end of our work, during which time it became clear that his early interest in education, as a teacher in Papua New Guinea, has remained alive through a long career of national leadership. We hope that our report will provide a framework through which the two Prime Ministers can turn their shared vision of the role of education and of the universities into steps forward in Papua New Guinea development.

We have received strong support from many Papua New Guineans and Australians throughout our work, reflecting keen interest in the Papua New Guinea universities and their contributions to national development. It is impossible to record the contributions of everyone who contributed substantially to this review, and the inevitable omissions by name are invidious, but we would like specifically to mention some of those who helped us.

We have been assisted throughout our work by conscientious support of high professional quality from our small and effective secretariat, comprising Mr Joshua Himina, from the Papua New Guinea Department of Planning and Monitoring, and Mr Peter Coventry, from The Australian Agency for International Development (AusAID). Joshua and Peter helped us to plan our approach to the review, undertook and wrote up important research on many of the issues covered by the report, were the first points of contact for consultants to the review, organised the seminars in Canberra, Melbourne and Madang, and played important roles in the writing up of the report. They were also excellent company as we visited Papua New Guinea educational institutions all over the country, and worked our way through the preparations and the drafts. Thank you, Joshua and Peter, for excellent work.

Special thanks to consultants to the review who prepared specialist papers, notably Professor Bruce Chapman of The Australian National University, Mr George Bopi of the ManTech Consultancy, Professor Vin Massaro and Mrs Lorraine Perry of Massaro Consulting Pty Ltd and the LH Martin Institute for Higher Education Leadership and Management, The University of Melbourne, and Professor Ken Gannicott. Their final reports to us are available on the review's website [www.ohe.gov.pg](http://www.ohe.gov.pg). Special thanks to Dr Andrew Elek, whom we encouraged to resume the work on education and development in Papua New Guinea that he began in his graduate student days in the 1970s. Andrew participated in our

seminars in Madang, Canberra and Melbourne, and contributed a great deal in analysis and suggestions for policy.

We are grateful for the good work of Ms Veronica Webster and Ms Helen Taragau at all stages of the review in coordinating administrative arrangements and at the end in putting together parts of the final draft.

Thank you to the Secretary for National Planning and Monitoring, Mr Joseph Lelang, for consistent support throughout our project, including through the secondment of Mr Joshua Himina to our project. Thank you also to Hon Michael Ogio, Minister for Higher Education, Research, Science and Technology, Mr Simon Kenehe, Chairman of the Commission for Higher Education, and Dr William Tagis, Director-General of the Office of Higher Education, for consistent support, including through the provision of an office for our secretariat, and for much good advice. Thank you also to AusAID, who funded the project, and made it possible for Mr Peter Coventry to work with us.

We received much welcome assistance and advice from the Acting Chief Secretary Mr Manasupe Zurenouc, the Prime Minister of Papua New Guinea's Chief of Staff, Mr Paul Bengo, the Secretary for Education, Dr Joseph Pagelio, Treasury, Mr Simon Tosali, Labour and Employment, Mr David Tibu, Foreign Affairs and Trade, Mr Michael Maue, Justice and Attorney General, Dr Lawrence Kalinoe, Health, Dr Clement Malau, Auditor-General, Mr George Sullimann and the Commissioner for Internal revenue, Ms Betty Palaso.

We received unfailing support, much crucial information and advice in visits to the universities and in three seminars from the six Vice Chancellors, Professor Ross Hynes (University of Papua New Guinea), Dr Misty Baloiloi (University of Technology), Professor Philip Siaguru (University of Natural Resources and Environment), Dr Gairo Onagi (University of Goroka), Father Jan Czuba (Divine Word University), and Dr Branimir Schubert (Pacific Adventist University). We are also grateful for assistance from the leaders of the substantial research organisations in Papua New Guinea, notably the Institute of Medical Research, the National Research Institute, the National Agricultural Research Institute and the Cocoa Coconut Research Institute.

The Divine Word University in Madang, the Australian National University in Canberra (through the Crawford School of Economics and Government) and the University of Melbourne (through the LH Martin Institute for Higher Education Leadership and Management) hosted seminars that were important in the developing of our thoughts, and we are grateful to the leaders and staff of those institutions.

We received much support from many other institutions of higher education on our visits, and from many private sector institutions with close interest in the good health of Papua New Guinea's universities.

Without the strong support from the people specifically acknowledged here, and from many others, we could not have completed this work. Any omissions or weaknesses in the report are our own responsibility.

Ross Garnaut  
Melbourne

Rabbie Namaliu  
Kokopo

May 2010

## **Executive Summary**

Papua New Guinea's universities made a significant contribution to the nation in its early years. They can do so again but, right now, the quantity and quality of graduates is far short of what is needed—due to inadequate resources and a range of governance and general service quality issues.

With substantial income from resource-based projects in the contemporary resources boom, it will be possible to increase public expenditure—creating an opportunity to repair run-down services.

Papua New Guinea now needs a long-term strategy for better supply of public goods, including universities.

That strategy needs to recognise that while higher education is essential, it is expensive.

The basis of the strategy must include justification for making a large investment in a small proportion of the population, while more basic needs, including access to basic education, health and transport services, are not yet available in many parts of Papua New Guinea.

Expansion of universities is desirable, since Papua New Guinea is desperately short of skills for development but poor quality expansion is unaffordable.

Rehabilitating, or replacing, run-down existing assets, and restoration of quality, should precede any investment in expansion.

No new funding from government or development assistance sources should be allocated for additional enrolments to institutions which do not demonstrate steps towards and then measurable improvements in quality.

It is likely to take a decade to raise quality to an extent that provides a sound base for rapid expansion. Significant improvement in the quality of graduates needs better input from secondary schools. That will take some time, even if investment is made now. It will also take time to repair the run-down facilities at universities and to repair weak governance.

This report sets out recommendations for the universities. The most urgent needs are as follows:

- Limit expansion of State-funded places at State universities to 3-4 per cent per year for the next decade, just above the rate of population growth, while the quality base is being rebuilt. There can be faster return to growth if high quality standards are being met, and there can be supplementary growth from private universities.

- End the downward slide in funding per student, and begin the process of rehabilitation of funding as a basis for improvement of quality. Provide for limited growth in student numbers, by allowing base grants to State universities to grow at 3-4 percent per annum in real terms, in line with growth of enrolments and start the process of increasing funding per student in ways that do not impose excessive burdens on the rest of the community.
- Repair and expand National High Schools to improve the quality of intake to universities. Good outcomes from all other reforms depend on this.
- Restructure and strengthen the Commission for Higher Education so that it can work with the universities in implementing agreed reforms:
  - set up and implement a new financing model
  - link funding to numbers of good graduates, not to enrolments
  - establish professional management of university finances
  - make funding contingent on fixing governance
  - structure funding to provide incentives for performance
  - provide limited base grants to private universities to support growth in student numbers in health and education
  - allow increases in tuition fees and recovery of costs of accommodation charges without discouraging participation of students from low-income families by introducing a Higher Education Contribution Scheme (HECS)—student loans that are repaid through the taxation system when income exceeds a specified level
  - introduce a professionally managed Universities Endowment Fund to encourage and to make the best use of private donations to universities, coupled with professional management of land resources to expand income-generating “endowments” of universities
  - establish a Universities Capital Priorities List and Fund, for the rehabilitation and expansion of capital assets, and utilise effectively funds from Work Licence Fees and donor funding.
- In terms of staffing:
  - raise conditions for staff who are 100% committed to teaching
  - require explicit contractual arrangements for outside employment, with staff members “buying out” a proportion of their time for private practice, consulting and other external activities. Such contractual “buying out” of time should be readily granted for suitable activities

- provide all staff with housing allowances rather than some staff with highly subsidised university housing
  - enforce contracts strongly.
- PNG will continue to be short of skills for a long time. That reality will not be changed by placing quantity above quality. In this context,
  - the focus on localisation of skilled and professional employment should shift from restrictions on entry of foreigners (Work Permits) to expanded investment in generating larger numbers of well-trained and well-educated Papua New Guineans and
  - old work permits should be replaced with work licences, that are readily available but which attract a high fee that is returned as investment in the upgrading of Papua New Guinean education and skills formation.
- There are a number of ways in which the efficiency of Universities can be increased:
  - changes to the structure and composition of university councils
  - amalgamation of smaller institutions, for which there is some scope but this should ensure survival of pluralism
  - Goroka University should be the base for a strong Highlands campus of the University of Papua New Guinea
  - The University of Natural Resources and Environment (UNRE) has a crucial role to play in educating people for broadly based rural development. A feasibility study should be conducted now to determine what is necessary for UNRE to play this role. UNRE should be rebuilt on the basis of the feasibility study, but folded into the University of Technology if there is no commitment to Papua New Guinea having a strong university producing the skills that support broadly based rural development.
- High quality telecommunications and modern systems of communication are essential for high university performance. All higher education institutions in PNG should reorient themselves towards taking advantage of information and communications technology:
  - not primarily for cost-saving, but to enhance the capacity of scarce staff and financial resources, and for keeping up with international thought and teaching, for which communication systems are critically important
  - to allow distance education that can complement, but not substitute on-campus learning.

- It is not desirable in the period of recovery of quality to create any separate institutions for distance learning. The decision of the Papua New Guinea Government to create an Open University should not be implemented for the time being.
- Universities need a much better national services environment. In particular,
  - PNG Government efforts to improve power by private generation can ease the acute power problem
  - cooperation amongst universities and access at low cost to underutilised transponder capacity is critical to removing telecommunications constraints on high performance.
- Quality control must be established as a routine dimension of university administration, involving:
  - regular independent assessments at university, faculty and department level, with international standards and professional inputs
  - twinning arrangements with Australian universities, first of all at institutional level, and separately and where appropriate at faculty, department and individual levels, all with focus on durable, long-term arrangements.
- Research of high quality is important to a good university and to Papua New Guinea life. It is hardly present at all in Papua New Guinea universities. It should be introduced as an important part of university work without disruption of the teaching function:
  - through nurturing and strengthening specialist research institutions and linking them more closely to universities when the latter have demonstrated capacity to be good research partners
  - through introduction of a Papua New Guinea Research Council
  - an Australia Papua New Guinea Council for International Research
  - with academic staff contracts carrying no automatic requirement of research but with easily accessible opportunity to enter contracts with research time funded by university, national or international research funding mechanisms
  - all with a focus on international standards and publication of research output.



Looking ahead:

- this Universities Review should be followed soon by a review of other higher education in Papua New Guinea
- it must be recognised that expanding education and health services is dependent on high quality expansion of higher education and
- the current review should be followed by another review in time for development of a new planning framework for 2020-2030.

Implications for Australia-Papua New Guinea Cooperation:

- The success of the reforms suggested in this review is more likely with strong Australian technical support, and with total funding in the range of \$20-30 million per annum over the next decade. The review's suggestions for Australia-Papua New Guinea cooperation are covered in the last section of this report.

## **The Role of the Universities**

You asked us to review the condition of the Papua New Guinea Universities, to assess whether they were performing the roles required of them in Papua New Guinea development and to make recommendations on steps that could be taken to strengthen their contributions.

We have been pleased to undertake this task at a pivotal time in Papua New Guinea development.

In this Report, we outline the context in which our recommendations have been framed, and summarise the main recommendations. Another, more detailed paper, Background Papers and Analysis, will present detailed information and analysis which helped us to our conclusions and policy recommendation.

## **The Economic Setting**

Papua New Guinea is a complex polity, economy and society, of considerable size in the Southwest Pacific context. Its thirty five years of Independence to the present have seen no growth in output per person in Papua New Guinea, somewhat higher growth in average real incomes of Papua New Guineans, and some small but positive change in the basic indicators by which development is usually measured.

There have been marked differences in rates of economic progress over different periods:

- economic stability with growth in output roughly keeping pace with population and rapid increase in the proportionate role of Papua New Guineans in the economy for a decade and a half from Independence;
- the onset of civil war in Bougainville in 1989 causing severe disruption and immediately successful but painful and ultimately disruptive economic adjustment ;
- economic instability and, after a brief resources investment boom, falling real incomes with deterioration of economic and political institutions from 1992 until 1999;
- institutional reform and stabilisation and the restoration of the basis for but not yet the reality of growth in output per person 1999-2002;
- low, steady growth until the resources boom which rapidly gained strength from 2005; and
- strong growth since then, despite the global financial crisis.

The most likely prospect now is for an extended period of strong economic growth.

At self government, thirty seven years ago, the economy comprised mainly a large number of villages producing most of their goods and services from subsistence, augmented by small values of cash crops in favoured areas; together with a large public sector (recurrent government expenditure more than half of GDP and government capital spending on top of that) funded directly or indirectly mainly by foreign aid; together with one large copper and gold mine on the island of Bougainville. The upper levels of the public service were staffed entirely and the middle levels overwhelmingly by foreigners. Virtually all businesses of any scale were owned and managed entirely by foreigners.

There was no Papua New Guinea provision of full secondary let alone university education until the mid-1960s. At that time, realisation that independence would come sooner rather than later led to the crash development of two national secondary schools going through to Form 5 (New South Wales matriculation) at Sogeri and Keravat, and two small but well-staffed and well-funded universities (one initially designated an Institute of Technology), with the over-riding objective of educating people for leadership roles in the public sector.

This quick and large investment in advanced education was remarkably successful. The early graduates of the universities became the leaders of public service departments and other public institutions within five years of the University of Papua New Guinea producing its first graduates. The first generation of graduates' success in their demanding roles was critically important to democratic institutions taking root in Papua New Guinea, with an independent judiciary, and the institutions of a market economy and the beginnings of localisation of business ownership and senior echelons of business personnel. The students in that first generation played leading roles in dismantling the institutionalised racial discrimination that had been a feature of life in the territories of Papua and New Guinea.

Papua New Guinea has now become a much larger and more complex economy and society. Population has more than doubled, making Papua New Guinea the second most populous of the Southwest Pacific countries, ahead of New Zealand and in a league of its own amongst the island states stretching from Timor to the Polynesian communities of the Eastern Pacific.

Australian aid, once accounting directly or indirectly for most monetised economic activity, now represents a small fraction of expenditure within the economy and a moderate proportion even within the greatly reduced public sector. There has been a vast expansion of monetised exchange of food among other things. The Papua New Guinean-owned and managed business sector is now substantial. The major bank, accounting for almost half of the banking business and owned by Papua New Guineans, came through the global financial crisis without any government guarantees on deposits or wholesale borrowing, despite the Australian parents of its major competitors having access to such support. And a dynamic resource-based economic sector of considerable complexity contains enterprises of world class and

scale in minerals, energy and agriculture, with Papua New Guineans playing major management and technical roles, and moving from there to senior positions outside Papua New Guinea in large global enterprises.

The economy has developed within tight fiscal constraints since Independence. Indeed, the central macro-economic story from Independence until recent years was one of rapid decline in the role of the public sector, dragging down total growth rates directly through its effects on demand for goods and services, and affecting development also through the decline in the provision of many services that are essential to development.

Inflation-adjusted government recurrent expenditure was 29 percent lower in 2009 than in 1993, despite population growing by 65 percent over this period. Real per capita government recurrent expenditure was 46 percent lower in 2009 than in 1975. Such a large decline in real public expenditure per person is, so far as we can gather, unique in the world, except in countries that, unlike Papua New Guinea, have descended into comprehensive civil disorder.

The large decline in foreign aid, and the shift of the reduced levels of aid from untied cash grants to programs administered outside the budget, together with the loss of the Bougainville mine in 1989, made it necessary for the core public sector activities to experience radical decline. A tight hold on government expenditure through the first thirty years after Independence was, given the public revenue constraints, essential for economic stability and ultimately for civil order within a democratic polity. It is commonly believed that Papua New Guinea governments have had access to large amounts of additional public revenue from its resources sector since Independence. However, it has only been in the post-2005 resources boom that the real level of income from all of the resource projects combined has approached and then exceeded the levels from the Bougainville mine at Independence.

The tight constraints on public financial resources clashed with ambitions for improving services of all kinds, and the result was disappointment, and a drag on economic growth and development. The effects of the decline in real fiscal capacity per person were exacerbated by mismanagement of many government functions.

The decline in real per capita Government expenditure affected all of the core development services provided by government, but went much further with higher education than in other areas. In 2009, the inflation-adjusted public funding per student made available to the universities was about one fourteenth of the level in the early years of Independence. Some downward adjustment in the share of public resources going to the universities was warranted after the crash programs preceding Independence, but the correction went too far.

Since 2000, Papua New Guinea has entered a period of change that holds out prospects of raising both the complexity of the economy, polity and society, and therefore the demands on leadership capacities and educational resources, and the

availability of public financial resources to support improvement of services for development.

The role of foreign aid in the economy has fallen to the point where the long, downward adjustment in the real value of foreign aid can no longer be a heavy anchor dragging on national economic growth. And the global resources boom associated with the acceleration of growth in the Asian developing countries in the early twenty first century has vastly expanded Papua New Guinea's revenues from the resources sector and is set to keep on expanding revenues in the years ahead.

International investment interest in Papua New Guinea's natural resources is now immense. The government and community focus recently has been overwhelmingly on the liquefied natural gas project in the Southern Highlands with LNG processing in Port Moresby. This is a large project by any standards, including earlier Papua New Guinea experience. In due course, it will add greatly to the public revenues.

The current Southern Highlands-Port Moresby investment is likely to be the tip of the iceberg, as work proceeds on other petroleum and metallic mining, and projects based on Papua New Guinea's renewable energy, and the country's vast potential for sustainable development of forestry, fisheries, agriculture and tourism. In the meantime, the resources boom has greatly increased revenues from resource projects established in earlier times. Since 2007, the Ok Tedi mine alone has contributed more than twice as much to financing public expenditure as Australian aid. Dramatic increases in revenue from other established resource projects have emerged through the resources boom, or are set to emerge over the next year or so.

The global resources boom was checked for a while, but only a while, by the Great Crash of 2008. The long-term consequences of the global financial crisis of 2008-9 include a lower long-term growth trajectory for most of the old industrial countries. But the Great Crash has had little effect on the growth momentum of the large developing countries, led by China, India and Papua New Guinea's neighbour Indonesia. And it is demand generated by these rapidly growing developing countries that has been the source of the early twenty first century resources boom.

This new environment for Papua New Guinea development is both a challenge and an opportunity. Both of these are captured in the Papua New Guinea Vision 2050, in Prime Minister Somare's and Deputy Prime Minister Temu's statements about that Vision, and in The Papua New Guinea Development Strategic Plan 2010-2030.

For the first time since Independence, in recent years, and now in 2010 more strongly than ever, there is reasonable expectation that Papua New Guinea's need for expansion of development services provided by Government, including education and health as well as the basic institutions of good governance and order, will be accompanied by growth in real financial resources. At the same time, the demands on the institutions of and services provided by Government will become much larger and more complex.

If Government is able to respond effectively to the increased demands on it, the early twenty first century resources boom provides a basis for a long-term acceleration of incomes growth and improvement in all dimensions of Papua New Guinea development. But in the absence of a significant improvement in the quality of leadership and management of institutions in many spheres, leading to improvement in provision of many services, the resources boom will prove to be detrimental to broader national development. Amongst the changes required for success is movement to carefully managed expansion of expenditure on basic services necessarily provided by Government, after three and a half decades of exceptional constraint.

This is the essential context of our Review of Papua New Guinea's universities. The polity, economy and society are immensely complex. Good development outcomes will make exceptional demands on technical and management skills of all kinds, but much more than that. They require preparation of a new generation of Papua New Guineans for a wide range of leadership roles as complex and demanding as any which face leaders anywhere. The fate of Papua New Guinea Vision 2050, of the Strategic Plan 2010-2030, and of development outcomes in Papua New Guinea more generally, depend on success in development of that leadership.

### **Demand for Skills**

There is a critical shortage of virtually all of the skills that are generated in institutions of higher education. Papua New Guinea is not producing the teachers in quality or quantity for maintaining into the future existing standards of general education, let alone the vast increase that is demanded by the democratic polity and routinely recommended by the international development agencies and internal and external reviews of development.

To plan for huge increases in school enrolments in the absence of capacity to train teachers to adequate standards would be no more than pretence; pretending to educate children with pretend teachers trained in pretend universities and teachers colleges.

Neither does Papua New Guinea have, nor is it producing, the health professionals on a scale or of a quality that are required for the most basic improvements in health conditions. Papua New Guinea has 0.08 doctors and 0.62 trained health workers per thousand residents. This compares with an average of 0.48 doctors and 1.11 health workers per thousand residents among the developing countries considered to be particularly poorly supplied with health workers; and an average of 0.22 and 0.77 per thousand amongst the subset of the poorly supplied countries that have particularly high mortality rates.

The excess demand for all of the skills required by the expansion of the non-renewable resources sector is more acute now than ever before, and will grow wider in the period ahead.

There is an acute shortage of all of the types of expertise necessary to ensure that opportunities for expansion of the renewable resource industries, many of which have great potential for operation at village level, are not lost in the rush of scarce skills to the large non-renewable resource projects.

There is an immense backlog in investment in the range of high-level skills required for leadership of institutions in the public sector and civil society as well as business.

The challenge of filling these large and growing gaps has been exacerbated in recent years by the emergence of a brain drain. This was apparent first in industries requiring specialised technical skills: the mines and petroleum projects, the airlines (especially pilots), and some businesses requiring commercial skills. It has been extended recently to virtually the whole range of skills, including with governments in Australia and elsewhere actively recruiting Papua New Guinean health professionals.

The national shortage of professional and technical skills of virtually all kinds has greatly increased the costs of providing most services. In the resources and commercial sectors, the necessary and pervasive presence of foreign personnel has established remuneration and other employment conditions beyond those commonly available in Australia, which is currently one of the highest-income countries in the world. Salary and wage levels for Papua New Guineans have mostly been kept well below those levels, especially in the public sector, but the general shortage of skills is making such an approach difficult to reconcile with containing the brain drain.

Recent analysis suggests that expenditure on foreign personnel alone amounts to over three quarters of a billion kina per annum, or about three and a half percent of GDP. This is unusual. The social as well as private rate of return on good, high-level education is extremely high, even if we calculate only the financial value of replacement of imported personnel. The social rate of return on the skills and capacities necessary for good governance is higher still, by a wide margin.

Expansion of direct provision of overseas skills can fill gaps where they are most costly, as they are filled by the Enhanced Cooperation Program's (now called the Strongim Gavman Program) support for the central agencies. But this comes at high financial cost, with the inevitable sacrifice of Papua New Guinea experience and memory, and without filling the void in educated Papua New Guinean participation in the democratic process.

The high cost of professional and technical skills is a drag on all private sector development. It is also a source of extreme disparities in the distribution of income within the country, contributing to social and political tension, and complicating the management of Papua New Guinea's relations with the international community.

## **The State of the Universities**

The universities did very well in the early years of Independence. They were able to meet extraordinary demands that were made on them to provide leaders of crucial public institutions. But major changes in the universities are necessary if they are to be successful in meeting the even larger contemporary challenge.

Our recommendations are directed mainly at the four State universities, and this summary of recommendations focuses mainly on them. Some recommendations relate to the two private universities as well.

Together the Papua New Guinea universities provide for a number of students that is small by any international standards relative to the national population and to the demand for professional and technical skills. There is a pressing problem of quantity, reinforced by the widespread and powerful demands by parents for more university places.

Regrettably, we see an even more pressing problem with quality of the educational experience. There are important exceptions—for example, the strong demand for geologists trained at the University of Papua New Guinea in the Australian and global mining industries says something positive about quality, from which we can draw lessons for improvements in the system generally. But the general story of standards is an unhappy one. In many fields (and again with important exceptions), standards have deteriorated over time. We have reluctantly come to the conclusion that a high proportion of the courses in Papua New Guinea State universities are not taught at an adequate standard.

We conclude that for the next decade 2010-2020, the primary focus of reform should be on raising standards to acceptable levels, with expansion of numbers only where and to the extent that this is compatible with the raising of standards.

It seems to us that the problems of low standards has many causes, any one of which would be large enough to block satisfactory performance. It follows that reform must proceed along a broad front if it is to have any chance of success. The critical blockages to high performance, and therefore the critical priorities for reform, are the following:

(I) Funding

Inadequate funding of the State universities is a sufficient condition for failure to meet adequate standards. Funding in real terms per student has been declining since Independence. The decline accelerated sharply through the economic instability of the mid-1990s. Currency depreciation and inflation in the absence of significant increases in nominal funding stripped the universities of many internationally competitive staff. Expenditure on maintaining assets and investment in the quality of the teaching environment was cut to negligible levels. Quality reviews involving academics from other



institutions could not be funded and stopped. Real funding per student continued to decline after the stabilisation of economic activity and institutions in the early twenty first century.

The mechanisms through which funding is provided is adding to the funding problem. Most recurrent funding decisions are made year by year through the budgetary processes of the State. Maintenance funding is considered by a different group of officials from those who take the important decisions on core recurrent funding. Capital funding commitments from the National Government have been rare in recent times. Therefore, capital projects have depended on contacts between individual institutions and foreign funding agencies (and in the case of some capital projects, foreign businesses that have then sought support from their Governments).

There is no overall or long-term approach to university funding. Decisions by the agencies of the State have been informed by submissions prepared by underpowered university financial administrations. The submissions have been considered in an uncoordinated way by a variety of people, none of whom knows much about how universities work. The end point has been the decline in real funding per student to the point where it is inconsistent with the universities carrying out their essential roles in development.

If the standards of the universities are to be rehabilitated and then improved to meet contemporary demands, university financial administration must be strengthened. The funding model needs to be reformed to allow long-term decisions to be made on resource allocation, with some confidence that the financial resources upon which plans are built are going to be available. At the same time, there must be opportunity for increased funding, in forms that strengthen incentives and pressures for good management and high standards in the universities. Within the overall framework provided by Treasury, Finance, and the National Planning Department, an administratively strong institution within the national government must be given responsibility for administering the funding of the universities.

Reform of funding is a necessary but not sufficient condition for the rehabilitation of standards in the universities. It is a necessary but not sufficient condition for the commencement of the long task of increasing the numbers of high quality graduates of higher education institutions to levels commensurate with the requirements of development.

There is no point in fixing the funding problem without removing other barriers to satisfactory performance.

## (II) Quality Control

Good outcomes at a university depend on regular and careful review of quality within each institution, including rigorous review of quality by external assessors who are qualified to form judgements about performance relative to relevant international standards. The reviews need to occur at the level of Department, Faculty and University. Such reviews have been introduced into the private universities, but are not generally part of the routine of State universities.

To the extent that partial indicators of quality are available, they tell an unhappy story.

Employers in all fields report that new graduates are poorly prepared to take their places in responsible positions without high levels of on-the-job-training—rather more training than would normally be expected of graduates. This message came to us from representatives of all of the business and professional organisations to which we spoke in the course of the Review, and also from leaders of the public service.

The general assessment was that there had been substantial deterioration in standards in recent years, and that the decline is continuing. Business and professional organisations generally provided a more positive assessment of the quality and preparedness for professional employment of graduates from the private universities.

The Australian Department of Education has recently produced an assessment that places a pass degree from a Papua New Guinea university at the level of an associate degree at an Australian university, and an honours degree at the level of a pass degree at an Australian or international institution. This assessment has been controversial in Papua New Guinea universities. It is not based on detailed analysis of individual courses and institutions, and no doubt the generality of the assessment is unfair to some courses and maybe to one or other institution. But there is also no doubt that it reflects a widespread view of people familiar with universities in Papua New Guinea and abroad. The absence of regular and rigorous external assessments makes it impossible authoritatively to assert an alternative and more favourable general view of standards in Papua New Guinea.

A new approach to quality review is required, both as part of a process of raising standards over time, and to demonstrate the quality of a Papua New Guinea university education to those who need an assessment of quality for professional purposes. A reliable process of review in quality will be needed

to change the current unfavourable perceptions as current weaknesses are corrected over the years ahead.

### (III) Governance and Ethics

There are problems of governance at the levels of national administration of higher education, in the high levels of university administration, and in the nitty gritty of staff and student administration.

At the national level, responsibility for leadership is shared among the Commission for Higher Education, the Office of Higher Education, the Minister for Higher Education and the university Councils. Some legislative changes and practices will be needed to clarify who is responsible for various policies which affect higher education.

The legislation under which Papua New Guinea State universities operate gives them high degrees of autonomy from Government. In financial governance, this extends to universities having a high degree of discretion in the use of funds provided by government.

This autonomy is appropriate; it should be maintained, and treasured as an essential element of a modern pluralist democracy. However, universities enjoying such autonomy and receiving high levels of funding from government must accept a reciprocal requirement to use resources effectively for the purposes for which they are provided: to account fully and transparently for the use of resources; to use public money with probity; and to produce satisfactory numbers of graduates in various fields, at sufficiently high standards. Accountability and transparency in use of government funds within the State universities falls well short of acceptable standards.

The structures and relationships within internal university management are major impediments to high university performance.

There are deficiencies in academic administration, most importantly in the absence or weakness of hard external review of teaching and research performance, with consequences for underperformance. In the State universities, unattractive employment conditions for high-performing staff sit alongside weak administration of rules on outside activities. For many (but certainly not all) academic staff, this combination seriously damages commitment to teaching. At its worst, many members of staff draw full salaries but participate in teaching only to the extent that it suits them and fits in with other professional activities.

Financial administration is weak. Annual audits and Annual Reports are often delayed for long periods beyond statutory requirements. The recommendations of the audit reports are often not implemented.

Problems of student administration and the absence of pastoral care in the State universities contribute to tensions on campuses and are serious impediments to satisfactory performance. Problems of student unrest and related disorder are acute within all of the State universities. The emergence of provincial or regional identity as a major element in aggressive behaviour requires analysis and response. The student administration problems underline the importance of ethical frameworks.

(IV) Weaknesses in the National Social, Economic and Administrative Infrastructure

National problems in the provision of social, economic and administrative infrastructure increase the difficulty and greatly raise the cost of satisfactory university performance. These are not only, or mainly, problems for the universities; but they represent large problems for the universities, and their removal is necessary for high performance in university education.

The main weaknesses for the universities relate to insecurity of people (affecting recruitment and safety of staff and safety of students, especially, but not only, females); unreliability and high cost of electricity supply; poor availability, unreliability and high cost of electronic communications within and beyond Papua New Guinea; and uncertainty and delays in the issue of work permits for foreign personnel.

The security problems are obviously not specific to the universities, but they are important sources of increased costs, and add to the problems of staff recruitment. They are most severe on the Port Moresby campus of the University of Papua New Guinea and the Lae campus of the University of Technology, but they are also serious in Goroka.

Careful engagement by university staff and students with large, neighbouring settlement and village populations seems to have been important in easing the potential for tension at Pacific Adventist University on the outskirts of Port Moresby, and at Divine Word University in Madang.

Increases in numbers of university personnel and others living in well designed accommodation on campus can provide additional layers of security at relatively low cost. On the main campuses in the big cities, increased expenditure on conventional security systems is necessary. For all universities, the concentration of growth in rural and small provincial locations rather than the bigger cities has security advantages, and there are opportunities for decentralising expansion in those fields of education that do not require close interaction with the main urban and commercial and government centres.

Power supply is appallingly unreliable in most of the towns of Papua New Guinea. This problem has become more acute with the increase in demand associated with the economic boom of recent years and expected to continue for a long time. Blackouts occurred on 25 occasions in the twenty four hours preceding one of our visits to the University of Technology in Lae. More frequent blackouts have occurred at times in Lae and in other centres.

Frequent blackouts make high performance at a modern university impossible. Amongst many adverse consequences, beyond some point they prevent work at night. They greatly shorten the life of all electronic equipment, particularly computers, and destroy their effectiveness in use. The provision of private power generation facilities can remove the problem of unreliability, but at great cost.

Apart from the mobile telephone networks which have recently been radically improved by the introduction of private competition with the State-owned Telikom, telecommunications in Papua New Guinea are limited in scope, unreliable and far more expensive than in developed and most developing countries. These barriers have been partially overcome for the provision of crucial domestic and international internet communications through clever innovation at some universities, connected to the development of the PNG-ARnet system, but satisfactory performance requires system-wide and country-wide change.

Universities are international institutions, drawing staff from many countries, and hosting many short-term visitors for various kinds of work. Papua New Guinea's work permit system for foreign labour is a large barrier to timely recruitment, introducing uncertainty into the offer of employment to people from outside Papua New Guinea, and sometimes discouraging people from taking up employment after they have been offered positions. Again, these are not only problems for the universities, but the costs of the weaknesses are exceptionally large for the universities and other institutions of higher education.

It is ironical that the Papua New Guinea work permit system was designed to promote and to accelerate the localisation of employment, but now inhibits the development of the skills and education amongst Papua New Guineans that is the key to successful localisation of high-level employment.

(V) Accreditation, Scale and Scope of Universities and Pressures for Expanding Student Numbers

Papua New Guinea Universities are small. Many of the world's good universities have more students than all six of Papua New Guinea's universities combined. This has led to suggestions for wholesale amalgamation—even to the formation of one State University out of the

University of Papua New Guinea, the University of Technology, the University of Goroka and the University of Natural Resources and the Environment.

There would be economies of scale in university administration from amalgamations. There would also be economies of scale from consolidation of courses across what are now separate universities, even if most currently operating campuses continued in service. Against this, there are advantages of pluralism, including the avoidance of catastrophic loss of university services through failure of governance at a single institution—an ever-present risk in any human activity, and a greater risk where, as in Papua New Guinea universities, there is a history of governance problems.

Consultants to the Review drew attention to the high costs embodied in the large number of small institutions of higher education beyond the universities, and suggested that there would be advantages in bringing some of them under the wing of universities. Where should the boundaries be drawn between activities conducted within universities, and those that are the realm of other and separate institutions of higher education?

While not of comparable importance to the universities in preparing Papua New Guineans for national leadership roles, other levels of technical and further education are crucial for good performance of the national economy and widespread provisions of basic services to Papua New Guinea communities through both public and private institutions. There are destructive shortages of all of the technical skills required in para-medical services, teaching in primary and secondary schools, and lower levels of government administration; in all technical activities within the resources industries; and of commercial and technical skills related to small-scale including village economic activity of all kinds, notably in the renewable resources industries (especially agriculture, forestry, fisheries and tourism) and provision of renewable energy.

The weaknesses in higher education outside the universities warrant a separate Review, complementary to this Review of universities. Just as the Commission and Office of Higher Education and the National Planning Department provided essential support for this Review, the Departments of Education, Health and Labour should provide support and guidance for the Review of other higher education. That separate Review would consider and make recommendations on the appropriate location of official responsibility for advising on policy and monitoring performance in higher education beyond the universities.

In some developing countries, and in four universities in Victoria, Australia, and in some other Australian universities, single institutions provide both

conventional university education, and other technical and further education. How far should Papua New Guinea universities go in this direction?

The success of two private institutions, one a public university closely connected with the Catholic Church and education system, the Divine Word University, and the other a private Adventist institution, the Pacific Adventist University, has stirred interest in private universities more generally. One Australian university, Southern Cross, offers degree courses through a Papua New Guinea institution (the Institute of Business Studies). The Lutheran Church is developing a proposal for another private university.

The Commission for Higher Education has developed rules for accreditation of universities. These seem to strike the right balance between being open to new private entrants, and containing within reasonable bounds the risks of students dissipating their academic potential and money in institutions with low standards.

Quality or quantity?

There is immense interest, reflected in pressure on the policy-making process in this vibrant democracy, for large increases in student numbers. It comes out as pressure to expand the range of things that universities do and the means through which they do them, as well as to expand the numbers of students within all established programs.

Accession to this pressure without comparable increases in funding has been damaging to the quality of university education in many countries, and has already had disastrous consequences in Papua New Guinea. It must be resisted in future if there is to be any hope of establishing reasonable standards in Papua New Guinea universities.

The expansion of university numbers requires more resources, as well as time and focussed effort to build institutional capacity. Thought can be given to more rapid growth and to financial means to support it, but plans for large-scale expansion should not be implemented until the quality objectives have been secured.

#### (VI) Preparation for Entry

Most entrants to university have not been prepared adequately by their school education. The National High Schools which were once the main source of university students have deteriorated to the extent that standards are generally no higher, and in some cases lower, than the provincial secondary schools.

Provincial secondary schools are not equipped to prepare students for adequate performance at university. It is widely believed that the quality of

entrants into high schools from primary schools has been adversely affected by the donor-sponsored education and provincial government “reforms” of the mid-1990s, involving rapid increases in primary school enrolments without commensurate expansion of teacher training capacity. The reforms also introduced elementary education (Grades 1 to 3 in Primary School) in Tok Ples, in the absence of teaching materials in Tok Ples (local languages), and led to expansion of provincial secondary schools.

Year 10 and Leaving Certificate in the national schools was once followed by a preliminary year at university, in which gaps in preparation for university were repaired. There is now no equivalent to the old preliminary year, although there are specialised foundation courses in some universities. All courses in all universities now need to devote time to remedial teaching in English and, where it is necessary, basic mathematics as well.

There is no practical means of raising standards over the next decade in all schools to levels that are consistent with satisfactory performance for most students at university, so our recommendations focus on cost-effective means of raising the level of students going on to university.

#### (VII) Staff Conditions and Practices

There are many dedicated academics working in Papua New Guinea’s universities, and some genuine heroes of education. This dedicated minority carries a disproportionate load, mostly for remuneration and opportunities for professional development that are well below those in countries where they could reasonably aspire to work.

At the same time, many fine scholars and educators have left the Papua New Guinea universities in these circumstances, for employment with foreign governments and international development agencies, overseas universities and research institutions and increasingly private business, including the resources sector in Papua New Guinea and abroad.

Many university staff members have sought to improve their own personal reward for professional effort by undertaking private consulting and advisory work, in the traditional professions (law and medicine) and in many other areas where academic skills have market value. Standard constraints on these outside earnings have mostly broken down in the State universities, to the point where it is seriously eroding the effectiveness of teaching, and increasing the load on staff members whose commitment to teaching and student administration is not diluted by outside activities.

#### (VIII) Research

Research is an integral part of the academic experience at universities. Participation in the generation of new knowledge through research can add to



the quality of teaching, especially amongst students with high academic potential. Research at the frontiers of knowledge in a discipline is one effective way of keeping university teachers abreast of new developments in the discipline more generally.

There is some new knowledge of great value for Papua New Guinea that can only be discovered by research in this country. This includes research on the political and more general history of this interesting young democracy; research on the uniquely diverse ethnography including linguistics of the country; social science research on modern political, economic and social institutions in this unusual setting; research involving the application of ideas about development derived from other countries' experience to the unusual context of Papua New Guinea; medical research on some unique diseases and disease patterns; and research in the biological sciences on the uniquely diverse living natural environment of New Guinea and its adjacent islands. An indigenous body of authoritative published work on Papua New Guinea is an essential element of nation-building.

We note the important role played in nation-building by the annual Waigani seminars at the University of Papua New Guinea, and the books generated from them, from 1972 through the early years after Independence. The recent revival of the Waigani seminars is an important and welcome development.

But while recognising the importance of good research for Papua New Guinea, it must be acknowledged that good research is difficult, and that research is rarely if ever sustained at high standards if it does not lead to publications in ways that are accessible to and subject to criticism by scholars in related fields all over the world. This will mainly involve publications of articles in international journals and of books by leading international publishers.

There is some place for a few Papua New Guinea journals—more over time, as scholarship expands in quantity and rises in quality, and generally on topics in which Papua New Guinea material provides special insights. In one or two fields, only a Papua New Guinea-based journal will serve an important public purpose. For example, a good national Law Journal, presenting information on and analysis of legislative and case law developments, is an essential support for an independent legal system in a democracy. These locally based journals will have value only if they maintain high standards. One test is whether they are attractive vehicles for publication by internationally reputed scholars. Another is whether they are discussed by scholars based elsewhere.

There is a special role for research related to Papua New Guinea policy—broadly defined to include long term development, political and constitutional

issues. Again, quality as measured by international discussion and commentary is an essential test. There is a dearth of economics and other social science public commentary of any kind on many current issues of immense importance to Papua New Guinea development. There is an almost complete absence of publications relevant to Papua New Guinea development policy in international journals from the staff of the universities and the National Research Institute.

There are several good research organisations in Papua New Guinea that operate independently of the universities. The Institute of Medical Research (IMR) in Madang and Goroka is a high quality research organisation, largely funded by international grants, employing and developing world class foreign and Papua New Guinea researchers, and generating a strong stream of publications in international journals. It works closely with the Medicine faculty at the University of Papua New Guinea, although financial and human resource strains on the latter have diminished the opportunity for cooperation in recent years. The National Agricultural Research Institute (NARI) undertakes valuable research with considerable contributions from international grants, and generates some publications that are noted internationally. The National Research Institute (NRI) maintains high governance standards and undertakes some valuable consulting work for government. However, its success as a research institution in the social sciences and humanities must ultimately be measured by the quality of its published research output, including as revealed by international recognition, and it has a long way to go on these measures. Productive interaction of these specialist research institutions with the universities is important to the national research effort.

There are also important agricultural research organisations funded and managed in varying degrees by the private sector. These represent a valuable component of the country's research capacity. The Oil Palm Research Institute at Dami in West New Britain, established initially by New Britain Oil Palm and now supported by all oil palm producers, undertakes world class research on disease, insects and plant-breeding. It has participated in joint research projects, funded by international research funding organisations, with leading universities in the United Kingdom and Australia. In addition to providing valuable services to Papua New Guinea industry, it generates significant income from the sale of seeds all over the world. The Coconut and Cocoa Research Institute (CCI), based in Tavilo (East New Britain) and Madang, has undertaken excellent work funded by industry and government and from time to time by international research funding organisations. It is currently experiencing hard times, and this has been effect and cause of diminution of private sector support. The Coffee Research Institute (CRI) operates on a similar model to CCI. There is a gap in the national institutional

structure for research related to technology applied to industry. Papua New Guinea Vision 2050 suggested that this should be filled by a new Technology Research Institute.

How can we introduce (or, more accurately, reintroduce) a research culture into Papua New Guinea's universities? How should the research effort within the universities relate to work in the specialised medical (IMR), agricultural (NARI) and social science (NRI) research institutions, and a new Technology Research Institute? How can we do this without diluting the teaching contributions of people who are not inclined to or accomplished in research, or diverting the universities themselves from the essential teaching objective?

(IX) Cooperation with overseas institutions

Universities are internationally-oriented institutions. They do not work without intense international interaction, through sharing the results of research and the tribulations of research in progress, exchanges of staff and graduate students, collaboration in research, and the sharing of the results of research in conferences and in other ways.

Because universities are international institutions, cooperation with Papua New Guinea universities has value for universities in other countries. Cooperation with universities in other countries can be of great value in the immense task of raising quality that lies ahead for the Papua New Guinea universities over the next decade. This Review, and its sponsorship by both the Australian and the Papua New Guinea Prime Ministers, can provide impetus to productive cooperation between Australian and Papua New Guinean universities. We see this as playing a large role in achieving change in many aspects of university governance, administration, teaching and research. We hope that this Australia-Papua New Guinea cooperation can provide a model and inspiration for other countries' links with Papua New Guinea universities.

## **Recommendations**

Here we make recommendations in each of the nine areas listed above in the discussion of the state of the Papua New Guinea universities. The ninth point summarises the recommendations related to Australian assistance. The list of recommendations is long and demanding. Regrettably, this reflects the severe and wide-ranging nature of the problems of the universities. We doubt that the universities can play the roles that will be necessary for successful, long-term Papua New Guinea development in the absence of progress across all of the nine areas in which we have identified weaknesses above, and in relation to which we now make recommendations.

Some of the weaknesses are of a kind that can only be corrected gradually over time. The inadequate preparation of high school graduates for entry to university, for example, can only be corrected over a minimum of nine years, as national high schools with disciplined, competitive entry requirements are rehabilitated or built and as students move through four years of education in them and then the four years of degree courses.

Reform across such a broad front runs risks of placing excessive demands on administrative and policy-making processes. However, partial and gradual reform runs a greater risk: that progress in some areas will fail to yield positive results because binding weaknesses survive in other areas, and lead to disillusionment with the reform effort.

There is therefore a need for a comprehensive set of policy decisions to be made in response to this Review, and for that set of decisions to be followed by the development of a realistic but ambitious schedule for implementation.

This Review is focussed on the shape of necessary reforms and not on the manner or the timing of their implementation. Its broad acceptance by the Papua New Guinea Government and an agreement on cooperation in its implementation between the Papua New Guinea and Australian Governments needs to be followed quickly by the reconstruction and strengthening of the Commission for Higher Education discussed under (III) below. The revamped Commission would then take responsibility for the implementation of the reform program. The Australian Government would need to provide technical support for the restructuring and the work of the Commission from the beginning.

An essential early task for the Commission will be to advise the Government on the sequencing and timing of recommended changes.

The more recommendations that can be implemented over the year immediately ahead, the greater the confidence within the university system that far-reaching change—the palatable and unpalatable alike—will actually occur, the greater the momentum for change, and the greater the likelihood that the necessary comprehensive changes will be achieved.

The long lead times for effective change makes the commencement of rehabilitation of national high schools an urgent matter. Rehabilitation of structures must commence as soon as possible, with a view to the first competitive Grade 8 entry examination taking place at the end of 2010, and the first Grade 9 entry being achieved in 2011. Any delay in making a start would push back by a full year the entry of graduates from the rehabilitated national high schools into the universities from 2015 as proposed, to 2016.

Some other changes could be made almost immediately, because they do not involve complex institutional development. These include the recommendations for

transfer of some additional land resources to the universities (see the recommendation under (Id (ii) to Id (v)). They would also include the shift suggested in (IV) from Work Permits to Work Licences, which could be implemented from the beginning of 2011, with the funds generated by the fee being applied initially to increased expenditure on major infrastructure maintenance projects at university and other higher education institutions.

This Review has been commissioned by the two Prime Ministers, and strong support from the Australian Government and close cooperation with Australian universities would make it much more likely that reform will be successful, and that the universities will make their necessary contribution to the health of Papua New Guinea's democratic polity and to successful development in the era of the global resources boom. The recommendations for Australian support of university reform are summarised in (X) below.

A number of our recommendations on Australian Government support take the form of proposals for technical assistance. We are mindful of the criticisms that are now commonplace of technical assistance through the aid program, and in particular of its high cost and because its transient nature prevents the accumulation and application of the wisdom of experience in Papua New Guinea. However, there are some areas in which the provision of technical assistance is going to be necessary for other transfers of resources to be successful. Some of the obvious flaws in past technical assistance can be avoided. Remuneration for Australian advisers can be disciplined more closely to the requirements of the market. And to the greatest extent possible, assistance should be provided within long-term institutional linkages that allow the accumulation of wisdom over time.

We see the recommendations of this Review as being relevant over the next decade, 2010-20. The success of the recommended reforms would change what is desirable and feasible in later years. This is the first comprehensive Review of the university system since the establishment of the universities in the 1960s. It should be followed by another comprehensive Review in time for its recommendations to be implemented immediately following 2010-2020.

#### (I) On Funding

These recommendations seek to correct what has become chronic underfunding of universities in relation to their responsibilities and roles in development, without adding unmanageably to the burden on the public finances. They begin with recommendations to stabilise basic funding per student in inflation-adjusted terms, and then recommend a number of innovative ways in which universities can be provided with the opportunity through sound management and good performance to increase the financial resources available to improve quality.

How financial resources are provided is as important as the amount that is provided. Recommendations are directed at supplying the universities with funding

opportunities in forms that provide a sound basis for forward-looking planning and resource allocation. Certainty is not an achievable goal for public or private finances in the real world, but uncertainty can be reduced by introducing clear and stable rules.

Clear and stable rules on public funding reduce transactions costs and politicisation of relations with Government. They enhance the independence of the universities, and with it their contributions to the institutional pluralism that is important to a healthy democracy. The reciprocal requirement is accountability of the universities for the use of money, the standards of education and the numbers and kinds of graduates produced.

If the proposed quality and financial accountability standards were met, the universities would have considerable discretion in how they applied the additional resources generated from effective use of new or expanded revenue-generating opportunities.

We recommend the following approach to allocating base grants from the State to the universities, first of all the State universities:

1. We recommend that the Commission for Higher Education Commission develop with external advice on the earliest feasible timetable a funding model for allocation of State grants to State universities based on outputs of graduates, and varied with level of qualification, costs of courses and minimum numbers of graduates in courses of large importance for development. The grants would be subject to specified requirements on financial and academic quality reporting.

2. In the meantime, pending the development by the Commission and acceptance by the Government of the new funding model, grants would be made on the premise that real recurrent funding per full time equivalent (FTE) student is maintained, and that student numbers are increased at a modest rate from current levels. Funded growth of 1 percentage point per annum above the population growth rate is suggested—about 3.6 percent per annum. This growth rate would double State university enrolments over two decades. It is far too low a rate to meet anything like current requirements and expectations on growth in graduate numbers. It can be accelerated if and when acceptable quality standards have been demonstrated.

We suggest one innovation in State funding to accelerate growth in student numbers in the two areas where skill shortages represent a binding constraint on Papua New Guinea development: health and education. We recommend the commencement of base grants from the State to the private universities for growth in student numbers in education and health. We suggest a grant of one half of the corresponding payments per student to State universities in relation to growth in numbers of students in education and health programs in the private universities. The focus would shift to growth in numbers of graduates in health and education courses as the new funding model is implemented.

The addition of support for growth in student numbers in health and education programs in the private universities would raise the growth in the real value of the base grants to the university system as a whole to perhaps 5 percent per annum. We expect that this will be lower than the rate of growth of real government revenue in the period ahead, and probably over the next decade.

3. By focussing on output of graduates rather than numbers of students, the new funding model would encourage and reward a large increase in retention rates, and increase the ratio of graduates to students from currently low levels. The implementation of the new funding model will need to take into account the efficiency gains from shifting to output-based grants, and implicitly allocate these gains between contributions to increased rates of student numbers (remembering that the amount of grants under the new model depends on quality standards being met, so that growth would be delayed by any initial failure to improve standards), and to improvements in quality.

We recommend that the growth in funding (in the initial period and subsequently) be applied disproportionately to the increase in student numbers at the State universities in areas of high national development importance where there are currently acute shortages of trained personnel (education and health in particular). In the case of Medicine at the University of Papua New Guinea, current numbers are too small for low costs per student to be attained, and we are not convinced that the limited capacity of the teaching hospital in Port Moresby is a binding constraint on expansion. Priority in funding expansion could also be given to some faculties that are currently too small to fulfil their national functions at reasonable unit costs, and where unit costs would fall with greater student numbers. Law at the University of Papua New Guinea is one example.

The capital component of grants (small in 2010) should be maintained in real terms. In the period prior to the development of the Universities Capital Priorities List and Fund (see (c) below) they should be applied through currently established mechanisms, administered by the Department of National Planning Monitoring.. After the establishment of the List and Fund, the capital component should be maintained in real terms, and made available to the Fund, under the administration of the Commission for Higher Education, and the general supervision by the Department of National Planning and Monitoring and central agencies.

Enrolment growth need not be constrained where there is administrative, financial and academic capacity to handle it, and where funds are not drawn from the government budget. Increases in student and eventually graduate numbers above the “funded norm”, suggested above, are likely to come from faster rates of increase in enrolments at the private universities, from the use of fees generated in some courses with high market value, and from industry-funded expansion in areas where commercial returns on education investment are perceived to be high. The latter will be encouraged by the establishment under professional management of the

Universities Endowment Trust (see (b) below). The potential for expansion of business funding is especially large at the University of Technology.

Growth in student numbers at the private universities would be supported by access to several of the institutional innovations discussed below, especially the Higher Education Contribution Scheme (HECS); the Universities Capital Priorities List and Fund; the Universities Endowment Trust; and the Papua New Guinea Research Fund and the Australia Papua New Guinea Centre for Research.

We recommend the following institutional innovations to support increases in real funding per student to the universities without unmanageable demands on public revenues, and without ordinary citizens having to pay unreasonably for transfers to a group of people (university students) who are later going to enjoy high incomes by the standards of the country:

- (a) The introduction of a Government-supported loans scheme to students in the form of a Higher Education Contribution Scheme (HECS) with the following characteristics:
  - (i) Design based on the schemes currently in place in Australia, New Zealand and the United Kingdom, administered by the Internal Revenue Commission as part of its administration of the income tax system; and established and in the early stages administered with Australian-funded support from the Australian Taxation Office;
  - (ii) Loans available to cover tuition fees imposed by universities, plus accommodation fees, plus a specified maximum "incidentals allowance". These loans would replace existing scholarships and government student loans. The maximum amount of the HECS loan per student would be established by the revamped Commission for Higher Education in the light of budgetary constraints. (Universities would be free to set their own tuition fees up to amounts specified by the revamped Commission for Higher Education as the reasonable cost of courses, less the amount of the State grant notionally allocated to the course by the Commission for Higher Education).
  - (iii) Details of the parameters of the scheme would be worked out in the course of its development. As a starting point for discussion, we would suggest that interest be applied to the loan at the Government's borrowing rate; and that a proportion (which could be one tenth or one twentieth of the loan (and interest associated with that one tenth or one twentieth)), be cancelled for each year of employment in Papua New Guinea by the Government or specified community organisations in the provision of education and health services and other specified development services.



- (iv) Repayment of principal and interest to be made by deductions administered by the Internal Revenue Commission when the graduate's income exceeds a specified level.
  - (v) Debt on existing student loans, for which no reliable repayment system has been identified and which have been generally not been repaid, also to be collected through the HECS mechanism.
  - (vi) Agreement to be sought from foreign Governments with similar student loans schemes to collect the repayments from Papua New Guineans who leave Papua New Guinea for overseas employment. It is recommended that the Australian Government agrees to play this collection role in Australia, and encourages other Governments to do the same.
  - (vii) The whole of the face value of each loan and additions to the loan would be made available to the relevant university at the time the loan or addition is established, as part or full payment for tuition or accommodation, or for passing on to students as an incidentals allowance.
  - (viii) The number of HECS-funded places would be no less than the number of State-funded places at the State universities plus available places of comparable academic quality at the private universities. Most HECS places would be allocated competitively at Grade 12 national examinations; with some available through the revamped Commission for Higher Education upon certification by the university that a student who had enrolled through another entry route was of comparable academic quality to those which had otherwise been eligible for HECS loans.
  - (ix) Students at private universities would have access to the HECS facilities on a comparable basis to students from State universities.
  - (x) The shortfall of payments to universities over loan repayments (with repayments initially confined to repayment of old loans through the HECS collection system and the shortfall therefore being especially large) to be covered by grants from the Papua New Guinea and Australian Governments; and after the initial university reform period 2010-20 by grants from the Papua New Guinea budget alone. There will always be a shortfall in loan repayments relative to new loans, because of failure of some ex-students ever to earn income that triggers repayment (because of choice of low-income employment in community service, the deductions of debt for community service, and in some cases early death, injury or other misfortune), and because of growth in student numbers and therefore loans over time.
- (b) The establishment of a professionally managed Universities Endowment Trust with the following characteristics:

- (i) Governance through a Board of Trustees comprised of fit and proper people with experience in senior positions of public trust. Trustees would accept responsibility for maintaining the identity and integrity of private donations to the Trust. The Trust would report regularly to donors and to the universities to whom endowment donations have been made, on the balance of each endowment account after drawdowns under the terms of endowment agreements, and after the attribution of income. The Trustees to take responsibility for appropriate investment strategies and investments, and to draw upon the advice of professional fund managers, including substantial fund managers used by one or more of the Australian universities with twinning relationships with Papua New Guinea universities (see (IX) below). It is recommended that at least in the early years, when the total sum under management is of modest dimension, that investment agency agreements be negotiated with one or more established fund managers in Papua New Guinea or abroad, with a commercial fee. Nasfund, Numbawan Super Fund, Defence Force Employees Super Fund (also known as Comrade Super Fund) , PNGSDP Long Term Fund and perhaps one or more of the investment funds managed by Australian universities in twinning relationships with State universities would be candidates for investment agency agreements.
- (ii) General administration and supervision through a special unit within the revamped Commission for Higher Education, drawing on specialised advice, with audit responsibilities lying with the Auditor General.
- (iii) The Trust to receive and to administer endowment donations from private or public donors within or beyond Papua New Guinea, There would be an endowment agreement with each donation. The endowment agreement would specify the purposes of the endowment (generally to endow a Position (for example, a Chair in Law, Medicine, Accounting, or Mining Engineering); or Scholarship; or Building; or Research Project or Program; or course; or Faculty; or lecture series. The agreement would also specify the institution that is to be the beneficiary of the endowment.
- (iv) Donations from individuals or companies within Papua New Guinea to be entitled to full deductions for income tax purposes. We recommend that endowment donations attract double tax deductions for as long as donations to major sporting events or institutions qualify for double deductions.
- (v) The Papua New Guinea Government to seek the agreement of foreign governments to grant tax deductibility for donations to the Trust from

their corporate or individual taxpayers, focussing especially on countries that have been beneficiaries of Papua New Guinea investment in education through the brain drain. The diplomacy to reach agreement on this matter to be accompanied by an appeal to private and public sector beneficiaries of the brain drain from Papua New Guinea to make endowment donations to the Trust.

- (vi) Endowment donations to qualify as payments for acquittal of companies' obligations under the "2% training levy" legislation. Donations that had been used to acquit obligations under the training levy would not attract double taxation deductions.
- (vii) Private as well as State universities to have access to the Endowment Trust.

It is anticipated that the Endowment Trust could become a major source of funding for Faculties and courses with immediate commercial application, such as Engineering, Metallurgy, Geology, Mining Engineering, other technical courses related to the resources sector, Law, Architecture and Building, and Accounting.

- (c) The establishment of a Universities Capital Priorities List and Universities Capital Fund with the following characteristics:
  - (i) The List to be developed within the revamped Commission for Higher Education, under the general supervision of the Department of National Planning and Monitoring, to define opportunities for productive investment in the capital assets of the universities, and to establish priorities for allocation of capital contributions from the Universities Capital Fund (see (iii) below), and foreign aid donors. Each component of the List to be developed in cooperation with a sponsoring university, to a stage where design allows reasonable estimates of cost. The sponsoring university would be responsible for maintenance of any assets created through disbursements from the Fund, and would need to demonstrate that it had made provision for the cost of maintenance. Allocations from the Universities Capital Fund to be according to List priorities
  - (ii) In the early years of the List, major projects to rehabilitate existing assets that had been badly run down would be given priority. Selection of projects from aid donors to be from the List but, in the normal course of development assistance diplomacy, to involve some element of choice reflecting donor priorities.
  - (iii) Universities in the use of their own revenues and other sources of cash (commercial revenues, authorised borrowings, savings from recurrent

income) and donors to the Endowment Trust would not be constrained by the List, but would be encouraged to choose items from the list. The revamped Commission for Higher Education may specify a Joint Funding List, which is given priority on condition that a specified proportion of costs are covered by matching funding from the universities or an Endowment Fund.

- (iv) After maintenance of established capital assets, highest priority in the List to be given to capital expenditure associated with expansion of capacity in areas of high national development importance.
  - (v) The Fund to be the recipient of capital grants from Government that are maintained in real terms at no less than 2010 levels and also of revenues from Work Licence fees. The Fund to be managed by the revamped Commission for Higher Education. Fund resources to be applied to the highest priority items in the Universities Capital Priorities List within a five-year rolling program.
  - (vi) Private universities to be considered by the revamped Commission for Higher Education for inclusion in the List in areas of high national development priority.
- (d) It is recommended that a number of steps be taken to enhance revenue-earning potential in the universities, in ways that do not involve risk of substantial commercial losses or diversion of effort from the academic purposes of the universities.

The universities have been encouraged by the central funding agencies of the Government to make greater use of commercial opportunities to raise revenue. Results to date have included the universities investing considerable effort and financial resources into such activities, and accepting risks of financial and reputational losses, for small returns.

There are a small number of ways in which universities can reasonably expect to generate returns that justify the effort and resources put into them. These opportunities should be fully utilised. It is important that university commercial enterprises are based on a clear-eyed view of areas in which they can expect to have advantages in a competitive market. In the absence of such advantages, failure is more likely than success, as universities are not set up for high commercial performance.

The two areas in which there are reasonable prospects for success on a substantial scale are the commercialisation of part of the universities' land resources, where these have become valuable through the growth of cities around them, and in focussed commercialisation of the universities' skills in special courses. There are some prospects for sale of expertise in

consultancies, and the commercialisation of some research outcomes, although these are not likely to be of large importance until some future time when research has become a major part of the strength of the universities.

Land resources that have become the property of a university through some or other historical process are the foundation for academic excellence of many of the great universities of the world. Columbia University's incomes draw upon the value of land that it once occupied in mid-town New York City, and which it utilised commercially when it shifted the campus to uptown Harlem. Much of the considerable wealth of Oxford and Cambridge colleges is built on land grants from monarchs many centuries ago. The University of Western Australia's favourable financial position has been built on the increase of the commercial value of its land endowments as the city of Perth grew around the campus at Crawley. The Massachusetts Institute of Technology and many other major universities in the United States were built upon land grants from state governments.

The land resources of the University of Papua New Guinea, in particular, and of the University of Technology, have become commercially valuable with the growth of Port Moresby and Lae, and especially through the contemporary resources boom. Careful marshalling of the value of the land, alongside careful campus planning to secure the academic requirements of the universities into the future, can make an important contribution to establishing a sound basis for long-term independence and excellence in Papua New Guinea universities.

Commercial activities, even such apparently straightforward matters as the extraction of value from land, are easily mismanaged. It is important that all commercial activities of the universities are managed within professional structures that are subject to high levels of commercial discipline and accountability. On commercial revenue earning opportunities, the Review recommends:

- (i) There should be no ambiguity about the universities' property rights in land allocated to them. The income generated from commercial use of land and academic resources should be available for investment in the academic enterprise without reduction of base grants from Government. This is important to the building of academic excellence over the long term.
- (ii) The Goroka University campus is too small for it to honour its academic responsibilities, and opportunities should be taken to expand the land resources available to it. The adjacent Goroka Technical School is too small for effective operations and itself has little room for expansion. It would be sensible for the Goroka university campus to be extended to

cover that land, and the functions of the Goroka Technical School merged into a larger proposed National Technical Institute at another location (see (V) below). We recommend that the extensive state land on the Highlands to the east of Goroka, the Menifo Agricultural Station at Benabena, be made available to the University of Goroka.

- (iii) The University of Natural Resources and Environment requires additional land for teaching and extension on livestock management. We recommend that the Warangoi Livestock Land currently under the control of the Department of Agriculture and administered by the East New Britain Provincial Government be given to the university as a campus for teaching and research related to livestock.
- (iv) It has been drawn to our attention that there are unused health education facilities at Laloki, near the Port Moresby campus of the Pacific Adventist University, that would be suitable for use by the university. Answers to our inquiries suggested that the Health Department had once had in mind the use of the facilities for in-service training. The facilities were constructed between 2000 and 2004 with a Papua New Guinea Government loan from the Asian Development Bank, and have never been used for the purposes of health training and education for which the loan was provided. There are suggestions that they may now be partially used privately and possibly illegally for activities unrelated to health services or education. It is recommended that these facilities be secured immediately for use in health education and training. Productive use could be made of these valuable facilities if they were made available now on a long term basis to Pacific Adventist University, with provision for access on a cost recovery basis by the Department of Health for in-service training of health officials and the University of Papua New Guinea Faculty of Medicine if this is judged to be of value.
- (v) In the University of Technology, much valuable land at and near the main campus in Lae is used for agricultural and forestry teaching and research. These activities can be transferred elsewhere without academic loss, freeing up the use of valuable urban land, whatever the outcome of the proposed feasibility study on upgrading UNRE (see (V) below). This, together with the land grants suggested in (d)(ii) and (d)(iii) above, will put each of the four or three State universities in a good position with respect to land for both teaching and accommodation facilities.

It is recommended that the universities adjacent to major towns (first of all the Universities of Papua New Guinea and Technology) develop comprehensive plans to utilise effectively their land resources. Within a

framework that provides for foreseeable requirements for teaching, research and administration buildings, and recreation spaces, and with a view to providing an attractive ambience for living and scholarship, the plans would define optimal development of housing and compatible commercial facilities. The leasing of space within this plan would become an important source of university revenue, to be reinvested in the academic enterprise. Partnerships with construction and development companies could be developed in which the university would earn a share of housing and commercial buildings through leasing access to the land.

With careful design, the more dense population of the campus, would lead to greater personal security on campus. Care would need to be taken to ensure that most resident people and activities share interests with the university community.

- (vi) Urban land and infrastructure are expensive in Papua New Guinea by global standards. There are advantages in utilising effectively any capacity that has been freed by reductions in alternative demands, or the preparedness of Papua New Guinea institutions outside the education sector to invest in education-related infrastructure. Two contemporary opportunities are noteworthy. First, Ok Tedi Mining Limited (OTML) will be reducing its use of the excellent urban infrastructure at Tabubil as it scales down mining from 2013 or 2014. Town capacity will be made available progressively for other uses over the next decade. Papua New Guinea Sustainable Development Limited, the development trust that owns a majority of the shares in OTML, has expressed commitment to investing in the conversion of town infrastructure for use in higher education, working towards a town after eventual mine closure that has as its main function the provision of education services. Divine Word University has expressed interest in use of some of this capacity. This should be a relatively low-cost way of expanding some university functions. Second, the Hela Provincial Government, which has access to substantial financial resources from the petroleum industry, has expressed interest in funding the building of infrastructure for professional and technical education related to the petroleum industry. Provincial Government provision of land and related infrastructure could provide the basis for a Highlands campus of the University of Technology and the associated National Technical Institute (see (V) below).
- (vii) Accommodation is a major constraint on student numbers and staff recruitment and retention at all universities. Off-campus accommodation is expensive and in several university towns insecure and in any case scarce. Partial provision for staff accommodation is

resented as a source of inequity amongst staff. The high value of presumed property rights in university housing is a cause of immobility of university staff, and a source of resistance to departure of staff who have stayed beyond the optimal tenure. It is desirable that provision of accommodation by the State universities for staff and students be placed on a commercial basis. For staff, this can be balanced by the provision of a housing allowance, whether or not a staff member enjoys access to housing on campus. The housing allowance would become part of the remuneration package for employees, the overall value of which would be assessed in terms of its adequacy for attraction and retention of high quality staff. For some staff members who were provided with accommodation on campus, the allowance could be made available in the form of a reduced rental rate, calculated in a transparent way from market rental rates. For students, any accommodation subsidy should be made available whether or not students are resident on campus. Costs of accommodation would attract loans under HECS, within the budgetary limits defined by the revamped Commission for Higher Education.

- (viii) There are some limited opportunities for universities to profit from the provision of courses, usually short executive courses, based on their academic expertise. Provision of such services should be seen as a commercial and not a community service activity. Such activities add to the load carried by teaching staff, and staff members should be remunerated separately for participation, and utilise “non-teaching” time under explicit arrangements with the university (see (VII) below).
- (ix) There are limited opportunities for universities to profit from the commercialisation of the intellectual property of staff members through consultancy contracts. Consultancies will sometimes be more efficiently undertaken by individual staff members, who are required to “buy out” teaching time as discussed in (VII) below. There is a place, however, for a commercial enterprise within the university to organise a consultancy contract, and to “buy out” the time of some staff members under (VII) below. While some consultancies bring fame and credit to the university, consultancies should always be undertaken with a view to full cost recovery, and if conducted through a university business, some profit for reinvestment in the academic enterprise. It is unlikely that the commercialisation of the research output of university staff will be an important source of income at this stage of development of the universities’ research capacity. However, it is useful now to put in place a commercial and management framework that will have its main value at a later time.



Undertaking commercial activities well, and avoiding costly mistakes, requires professional management. It is unlikely that all universities will find it worthwhile and in any case be able to accumulate and to develop the necessary professional management. Recognising that individual universities will lack business management capacity to use well these opportunities, it is recommended that the revamped Commission for Higher Education develop advisory capacity on business management and make it available to support the financial administrations of the universities.

- (x) The law provides for the exemption of education from taxation, including the goods and services tax. This exemption has been interpreted narrowly by the taxation authorities, to include only activities directly connected to the classroom. In truth, everything that universities do is meant to contribute to their education mandate. We recommend that the guidelines on taxation exemption be reviewed, with a view to inclusion of all activities except the specifically and narrowly commercial.

#### (II) On Quality Control

We recommend that universities be required to introduce regular and rigorous review of standards in teaching and research, by external people or organisations that are qualified to certify performance against international standards. We recommend that universities be required immediately to begin to put in place satisfactory regular review processes, and that future funding be conditional on satisfactory quality assessments.

Over the next several years, the balance of funding will shift from historical expenditure and costs of inputs, towards output of graduates at acceptable standards. The arrangements for quality control established by the universities will be supported and monitored by the revamped Commission for Higher Education.

#### (III) On Governance and Ethics

At the national level of governance, we recommend a legislative and administrative clarification of the respective roles of the Minister, Commission and Office of Higher Education. The Minister's role should be confined to working with the National Executive Council to define objectives and policy and to secure funding arrangements consistent with the delivery of policy, to explain policy to the community, and to review policy in the light of assessment of performance and of experience more generally

The Commission's role is to advise the Government on policy, to implement policy and to monitor performance against policy. If the Papua New Guinea

Government accepts the main recommendations of this Review, the Commission's central role over the decade ahead will be to implement the recommendations, and to assess the effects of recommended changes against various criteria. The Office of Higher Education, which currently functions to a considerable extent as a separate institution, would simply be the executive arm of the Commission.

The Commission and the Office together will need to be greatly strengthened to perform these roles. We recommend that the Commission comprise an Executive Chairman and two part-time Commissioners, all with deep experience of the university sector and paid at professional rates for their time. One of the part-time Commissioners in the early years should have deep experience in senior levels of university administration at a highly reputed foreign university or in a good foreign university system. The Chairman and the Part-Time Commissioners would be appointed by a standard Statutory Appointments Committee chaired by the Prime Minister and with the Leader of the Opposition and the Minister for Higher Education as the other members, with the Cabinet Secretary as Executive Officer, through a process co-ordinated by the Minister for Higher Education. At least one of the three Commissioners would be a man and at least one a woman.

The executive arm of the Commission would need to be greatly strengthened to perform the following functions:

1. The implementation of the new funding model for universities, and the authorisation of disbursement of funds from the Department of Finance following review of performance on reform and standards.
2. Monitoring results from regular, frequent and thorough review of standards of education at the universities against international norms.
3. Administration of scholarships and loans for students, gradually shifting the system towards reliance on the Grade 12 examination; and general supervision of the Higher Education Contribution Scheme, including the passing through of funding to participating institutions.
4. Administering the Papua New Guinea Research Fund, and coordinating this with the Australia Papua New Guinea Centre for Research.
5. Providing technical support for the business activities of the universities, including in relation to housing and other real estate development on university land, and commercial sale of university expertise.
6. Monitoring of university performance on financial management including through timely provision of audited accounts, and on governance more generally.

7. Administration of a professionally managed Universities Endowment Fund, in which each State university would be required, and each private university invited, to place private donations to support university activities.
8. Administration of the Universities Capital Priorities List and Fund.
9. More generally, the greatly strengthened Commission, incorporating the Office of Higher Education, would monitor the performance of the university system, and accredit institutions within the system.

On governance at university level, we recommend the vesting of authority in a Council of moderate size--no more than about twelve members. Appointments of Council members would be for long enough periods to allow strong identification with the institution and for Council members to see the impact of decisions for which they were responsible. We suggest terms of five to seven years, with the possibility of one but except in exceptional circumstances not two reappointments. All Council members would be subject to fit and proper person tests, and be expected to have experience in university education or research at least as students, to be highly respected in the community, to hold the view that the Papua New Guinea universities are of high importance, and to be committed to enhancement of the institution of which they are members. The Vice Chancellor would be ex officio a member of the Council, but no other staff member of the university would be a member. Current members of parliament have a poor record of participation in and contribution to university governance, and should not be members of Council. Three members of each Council could be community leaders of high standing appointed through a standard Statutory Appointments Committee, chaired by the Prime Minister, and with the Leader of the Opposition and the Minister for Higher Education as the other members. One of the three would be elected by the Council as Chancellor, and at least one of the three would be a man and at least one a woman. The process would be coordinated by the Minister for Higher Education and supported by the Commission for Higher Education. Two or three members could be elected by different categories of alumni, through processes supported by the Commission. Two members could be appointed by professional groups with interests in the performance of the university, such as the professional bodies for Accountants and Lawyers, the Chamber of Mines and Petroleum, the Minerals Resources Authority, the Departments of Education and Health, the Chamber of Commerce and Industry, and the various primary industries groups. One member of each Council could be appointed by the Council of Churches. One could be a former academic or an academic at another institution with a strong record of achievement in academic work, appointed by the academic staff. The balance of members would be appointed by the Council. Amongst members from the whole Council, at least one would have a strong record of management of a large and complex organisation. There would be no student or staff representation on the Council.

No member of the Council would be seen as representing the organisation which had appointed him or her. Reasonable annual fees would be paid, commensurate with the responsibilities and commitment of time. The Council would appoint the Chancellor and the Vice Chancellor. The Commission for Higher Education would develop a framework to guide Councils on proper process in appointment of Vice Chancellors.

On governance within universities, comprehensive strengthening of financial administration is required, amongst other things to ensure timely and adequate submission of audited accounts.

Student governance and administration in the State universities is deeply problematic. Intrusion of students' political perspectives into university administration has from time to time been destabilising in each of the State universities; tension amongst students divided on a provincial, regional and ethnic basis has been the source of major disruption to order and security; and a student culture that is indulgent in relation to alcohol and other mind-altering drugs is corrosive of academic performance and civil order. Some of these problems reflect the absence of a settled moral and ethical framework amongst many students.

There are no simple and comprehensive cures to these ills, but we suggest the following:

- (a) Recruitment of most students coming directly from school from national rather than provincial high schools will weaken the tendency for students from particular provinces to form tight groups that drift into tension with other provincial groups.
  - (b) The treatment of ethics in classes at national high schools and in first year university courses may contribute to the development of some new sources of resistance to anti-social behaviour
  - (c) Churches and other community organisations should be offered land on State university campuses to establish residential colleges, together with funding to levels that would have been necessary to secure conventional dormitory accommodation. In addition, such groups should be offered the opportunity to transform established dormitories into residential colleges with places for worship and community interaction.
  - (d) Student counselling services should be introduced where they do not exist and expanded where they do at the State universities, and the churches should be encouraged to introduce or to expand chaplain and counselling services.
- (IV) On Weaknesses in the National Social, Economic and Administrative Infrastructure

Our main recommendation on law and order and security on campus is to the universities themselves. The investment of effort into communications and productive interaction with communities in the neighbourhood of the universities, including through practical assistance in various ways that need not be costly, can assist in the building of trust and a sense of shared interests. We recommend that the universities devote careful effort in building these relationships, guided by expert analysis from the social sciences. This will not remove the external security problem, but will reduce its extent and damaging effects.

Access to reliable and reasonably priced electricity is a big problem, but can be fixed relatively easily and at low cost to the country. We recommend that the Papua New Guinea Government pursues vigorously its current policy of promoting public private partnerships in power generation, with private investors generating bulk power for bulk sale to PNG Power for distribution. There are large opportunities for relatively low cost supply of hydro-electric and in some locations geothermal power, for the supply of electricity to the locations of most of the university campuses: Port Moresby; the Lae-Highlands-Madang grid; the Wewak area; and New Britain. Should they choose to do so, the universities should be free to enter bulk power purchase agreements with private generators, paying a reasonable (and regulated) fee to PNG Power for use of the grid, and to distribute electricity on campus to users and to charge for electricity through mechanisms that they develop for themselves. The active implementation of this new policy could remove a major impediment to good performance in higher education within a few years, at no cost (indeed, some gain) to public budgets, and huge benefits to development generally.

On telecommunications and the internet, we have recommendations to the universities, the Papua New Guinea Government and the Australian Government.

To the universities, we recommend cooperation in the provision of internet facilities to connect university and other higher education campuses to each other, to other Papua New Guinea communities and to the world outside. Costs can be greatly reduced through cooperation amongst all Papua New Guinea universities, research institutes and other higher education institutions on shared use of telecommunications infrastructure, common agreements for use of software (for example, a common agreement with Microsoft), and on use of compatible hardware. Cooperation can extend to the sharing of facilities in each town where they exist for participation in distance learning. The PNG-ARnet provides a foundation for this cooperation. Effective cooperation amongst Papua New Guinea institutions would allow agreement with national research and education systems in Australia and other countries, which would generate support for capacity building and the development and transfer of skills. Once a sound basis for cooperation has been established within Papua New Guinea, interaction within AARnet in Australia could be encompassed within university twinning arrangements.

To the Papua New Guinea Government, we recommend the release of institutions of higher education from regulatory requirements to work through the State-owned telecommunications company Telikom. This has been done on a temporary basis for some institutions in relation to PNG-ARnet, through a pilot project sponsored by the Prime Minister in May 2006, and approved on a temporary basis by the Papua New Guinea telecommunications regulator PANGTEL in mid-2008. The release should be extended to all institutions of higher education and research and secured on a permanent basis. In addition, we recommend that the Government secure access for a consortium of institutions for higher education and research at marginal cost to excess capacity in the undersea fibre-optic cables connecting Papua New Guinea to the international telecommunications system through Port Moresby and Madang, and to excess Papua New Guinea-owned satellite transponder capacity. The access to fibre optic cable capacity is critically important to international and to satellite transponders to domestic communications. Cooperation amongst the universities can gradually extend the fibre-optic network from Port Moresby and Madang through the Papua New Guinea mainland. In advance of fibre-optic connections, most Papua New Guinea centres and institutions would be connected to each other and the outside world by satellite.

To the Australian Government we recommend that every effort be made to make available for the use of Papua New Guinea educational institutions, any excess capacity in satellite communications with a Papua New Guinea footprint that is within the influence of the Australian Government. Opportunities may arise incidentally to the improved provision of broadband telecommunications in northern Australia.

On work permits, we suggest that now, thirty five years after Independence, is a good time to shift the focus of localisation policy from restriction of employment of foreigners, to expansion of Papua New Guineans' capacity to occupy jobs requiring high education and skills. This shift of approach would recognise that university, technical and further education is now on the front line of the battle to increase Papua New Guinean participation in well paid and responsible jobs. There is far greater demand for employment than there are educated and trained and experienced Papua New Guineans to fill them, in all areas requiring higher education. Acceleration of excellent university, technical and further education of Papua New Guineans will loosen the bottlenecks that restrict more rapid localisation. It is now the most effective instrument of localisation.

We suggest two steps in the implementation of a new emphasis in localisation policy.

First, we recommend to the Papua New Guinea Government the exemption of institutions of higher education from the requirement to obtain a work permit for employment in Papua New Guinea. The recruitment of foreign personnel is part

of the process of ensuring an increase in the number of Papua New Guineans that are qualified to fill this and other positions requiring advanced skills. Of course, and as we prefer, if the second recommendation on work permits, described in the next paragraph, is accepted, the exemption would relate only to the licence fee.

Our second recommendation on work permits represents both a departure from current policy, and a significant source of funding for expansion of the numbers of Papua New Guineans who are able to fill positions requiring advanced skills. We recommend that the requirement for a work permit be replaced by a requirement for a work licence, which is available for skilled employment upon application and payment of a substantial monthly fee. Again, visas would be required through the Department of Foreign Affairs and Trade as they have been in the last thirty five years, with the normal security-related checks on entrants to Papua New Guinea. But there would be no need to seek a work permit from the Department of Labour, with requirements to present a localisation plan and to demonstrate that no qualified Papua New Guinean is available. The fee would be high enough to discourage employment of foreigners beyond the discouragement associated with high recruitment and employment costs. The discouragement would be greatest in relation to relatively unskilled workers. We recommend that the fee be set initially at K2,500 per month or K30,000 per year, indexed to increases in the Papua New Guinea consumer price index. If there were 15-20,000 foreigners working in Papua New Guinea through the resources boom, the licence fee would raise K45-60 million annually. We suggest that the whole of the revenue from the licence fee be appropriated from consolidated revenue to development of higher education. Proceeds from the fee would be allocated between the Universities Capital Priorities Fund discussed under (i) above, administered by the revamped Commission for Higher Education, and a trades skills development fund administered by the Department of Labour.

(V) On Accreditation and Scope of Universities and Pressures for Increasing Student Numbers.

We have formed the view that current arrangements for accreditation of universities are broadly appropriate. New private universities can be accredited, but only after demonstrating that they have met defined criteria including in relation to quality of educational content.

The Review recommends to the Papua New Guinea Government that each of the Universities be seen as national, multi-campus institutions.

Courses should not be offered if the number of students is below some economic threshold to be determined by the revamped Commission for Higher Education. There should be greater concentration of teaching of particular courses in one or other of the universities. Steps should be taken to facilitate to credit one or more

courses from one university into another's university's degree or other academic programs. Where gaps remain in the range of nationally important courses offered by Papua New Guinea universities on the grounds that student numbers are too small, opportunities should be created for some Papua New Guineans to study abroad. The Commission for Higher Education should coordinate the provision for scholarships to fill the gaps, wherever possible through the focussed use of donor scholarships.

The Review recommends that Goroka University, once an Education Faculty of the University of Papua New Guinea, be merged with the University of Papua New Guinea as a multi-faculty Highlands campus. Facilities at Goroka and the proposed Highlands campus extension at Benabena would be extended, and become a major campus of the UPNG. A substantial part of the expansion of the University of Papua New Guinea in future could take place at its Highlands campus. The land available at Benabena would also allow the establishment of adjunct facilities for other institutions of higher education and research that are based in Goroka and, like the University of Goroka, facing extreme pressure on space. The Highlands campus of the University of Papua New Guinea would then form the centre of a hub of tertiary education facilities.

The Government must take a major decision in relation to the University of Natural Resources and Environment, currently with campuses at Vudal in East New Britain, Bainik in the East Sepik, in Oro Province, and Kavieng in New Ireland (for fisheries). The development ambitions of the country beyond large-scale mining and petroleum depend critically on the success of industries based on the country's considerable agricultural, fisheries, forestry and tourism resources, on careful management of the natural environment, and on the use of local renewable energy sources to support rising living standards in villages and small towns. As recognised in Papua New Guinea Vision 2050 and endorsed by the Papua New Guinea Government in that context, and in the Papua New Guinea Strategic Plan 2010-2030, success in the renewable resource industries in rural Papua New Guinea is going to require deployment of technologies and management practices currently mostly unknown to Papua New Guinean villagers. Effective rural development needs to be supported by strong institutions for higher education and research, built around a good university anchored in the biological sciences and in social sciences with relevance to rural development. The University of Natural Resources and Environment is not currently that university. It would require a major injection of resources to build such a university to reasonable international standards, including of capital resources in the early stages. The Government must decide whether it will commit the large amount of resources to create such a university. Such a commitment would significantly expand the increase in government funding for the universities in the years immediately ahead.



The Review recommends that the Papua New Guinea Government through the revamped Commission for Higher Education works with the University of Natural Resources and Environment on a feasibility study for a good university based in the biological sciences and the social sciences related to rural development, and takes an early decision on whether to provide funds for such a university to achieve reasonable international standards. Staff members of the National Agricultural Research Institute and one of the Australian universities with strength related to the mission of UNRE would be useful members of the feasibility study team. The feasibility study would define the amount of funding, in addition to the funding for universities recommended in this Review, that would be required to achieve the objective of establishing a good university underpinning rural and sustainable industry development in Papua New Guinea. If the Government decides not to commit resources on such a scale, it would be better to absorb the current activities of the University of Natural Resources and Environment into the University of Technology, and to accept that Papua New Guinea will not have university-level capacity for teaching and research related to renewable resources and rural development.

In our view, a State university system with three universities with defined functions and multiple campuses would be appropriate. The University of Papua New Guinea would be the leading general university, offering courses across the range of social sciences and natural sciences and humanities, as well as Medicine and Law. The University of Natural Resources and Environment would provide education and undertake research related to the biological and social sciences, with a special focus on rural development. The University of Technology would be specialised in education and research related to industry, especially the large-scale production of petroleum, energy from other sources, minerals, manufacturing (including the use of Papua New Guinea minerals and energy resources in processing), construction and infrastructure development (including the provision of power, water and telecommunications and information technology), and on business disciplines related to this development. It is, on balance, desirable for it to eventually absorb the Geology Department from the University of Papua New Guinea, although arrangements would need to be made to continue to make use of synergies with earth Sciences programmes at The University of Papua New Guinea. The University of Technology would release its forestry responsibilities and capacities to the University of Natural Resources and Environment. Core disciplines in the University of Technology would include Mathematics and the Applied Sciences, Engineering (including mining, civil and electrical engineering), Metallurgy, Geology, and Architecture, with supporting strengths in related Commerce disciplines.

In addition, it is recommended that the University of Papua New Guinea become the home of a strong School of Government, referred to in Papua New Guinea Vision 2050 as the Somare School of Government. This would be a School with

considerable autonomy within the university. It would incorporate the current Institute of Public Administration, and its campus adjacent to the main University of Papua New Guinea campus. It would offer high-level teaching and research programs, for degrees and also short courses, relevant to administration and policy at the highest levels of government. It would play the role in Papua New Guinea that the main university components of the Australia New Zealand School of Government play in Australia and New Zealand, and the Kennedy School at Harvard University in the United States, in addition to providing good education and training relevant to lower levels of public administration in national provincial and local governments. Once it has established its credentials as an academically strong School of Government, it would seek to be a full university member of the Australia New Zealand School of Government. The School of Government would work closely with and draw on and contribute to the social science capacity of the university.

It is recommended that the National Research Institute become more closely integrated with the activities of the university, along the way to becoming part of the University of Papua New Guinea. Within the university, it would have a considerable degree of autonomy, analogously to the governance arrangements surrounding the School of Government. It would be home to the country's strongest concentration of research capacity in the social sciences and humanities. It would facilitate two-way academic exchanges and joint appointments with other universities and with other work units within the University of Papua New Guinea. It would preserve its current capacity for independent relationships with external donors and the Government. It would be expected to establish a high reputation for publications at international standards.

The Review recommends that each of the universities take responsibility for a range of sub-university higher education in areas close to the centres of their academic strength. Here the academic model would be the foreign universities that have technical and further education to certificate and diploma level within Universities. To the greatest extent possible (and what is possible will vary greatly across different areas of study), offerings at sub-university level should be built upon the academic strengths of the university, and courses for them be components of degree courses.

One major area of sub-university studies within the University of Papua New Guinea would be certificate and diploma level courses and executive courses in public administration within the School of Government. Another would be diploma level training of teachers following incorporation of Goroka University.

It would be desirable for the University of Technology to take responsibility for building a National Technical Institute, based on the established Technical Colleges at Lae, Port Moresby (Idubada) and Mt Hagen, eventually a southern Highlands campus teaching petroleum industry-related skills, and perhaps the

technical colleges at Goroka and Madang if these small-scale institutions have a place in a national system going forward. This would be a major national institution, working closely with the private sector and Government. Alongside this major State facility, the private provision of technical education would be facilitated, and encouraged through expansion of the current range of Government support.

We recommend that a School of Mines be established to coordinate interaction among the University of Technology, Government and business in relation to the mining and petroleum industries. The School of Mines would be an advisory body to the State universities and the Commission for Higher Education, and a focus for coordination of industry support for teaching and research related to mining and petroleum. It would monitor and provide feedback on quality of graduates. The governing body would comprise representatives of the University of Technology, the Commission for Higher Education, the Ministries of Mining and Petroleum and the Mineral Resources Authority, the Chamber of Mining and Petroleum, and directly from industry. It would continuously review higher education and research in Papua New Guinea, especially but not only within the University of Technology. It would provide advice on the content of teaching programs, quality, and opportunities for private contributions of funding through the Universities Endowment Fund or in other ways.

We recommend as well the establishment of bodies with responsibilities and structures analogous to those of the School of Mines in a number of other areas of professional study, including Law, Accounting and more generally of Business Studies.

The University of Natural Resources and Environment would offer sub-university courses in agriculture, forest management, fisheries and village business management. A base has been laid for agricultural components of these courses at Vudal and Popondetta, and fisheries courses at Kavieng.

What should be the role of distance education, incorporating teaching over the internet, in university education? We recommend that over the next ten years of focus on quality, distance education be seen as a support for general university programs and as a cost-effective means of transmitting certificate and diploma level programs to mature students, rather than a parallel means of delivering a full range of university courses to a full range of students.

It is essential that the same quality standards be applied to distance as to on-campus education. It is important that all students in distance education courses spend substantial and regular periods of time on campus, to allow face-to-face interaction with teachers and other students, and access to library and other university facilities. Satisfactory standards in distance education will also require access to face-to-face advice at decentralised locations.

All of this means that distance education may not be a particularly low-cost means of delivering full programs. It may, however, be a cost-effective means of providing access to higher education for students who are in employment and for whom full-time physical presence on a university campus has a high opportunity cost, allowing them to make a start in university education, to earn sub-degree qualifications, and to qualify for entry into degree programs. It is recommended that universities be encouraged to develop distance learning opportunities within this framework. We would recommend the facilitation of some distance programs going through to degrees, so long as provision is made for regular, intensive participation in education on main campuses, and so long as there is rigorous review of quality. We would not expect distance education to become a major channel for completion of degrees for the foreseeable future.

We recommend against the creation of a new university dedicated to distance learning in the period ahead.

(VI) On Preparation for Entry

There is no prospect of raising general school standards to levels that are suitable for university entry in the foreseeable future.

There is widespread perception that school standards have been deteriorating in most provinces, as a result of the general decline in real Government recurrent expenditure, weakness in public administration and services, the donor-sponsored education and provincial government reforms of the mid-nineties, and the expansion of student numbers without prior expansion of good tertiary education for teachers. It is an important national aspiration substantially to improve the quality and to expand the reach of school education throughout the country over the next generation. This cannot advance far or fast enough to raise standards for entry to university to minimum acceptable levels over the next decade. The relevant goal for the universities over the next decade is to produce enough well educated high school graduates to allow the universities to maintain acceptable standards in their own teaching.

Our recommendation to the Papua New Guinea Government is to rehabilitate the six national high schools. Once that is achieved, two more national high schools should be added to produce about 3,000 well-educated high school graduates per annum for entry into university in 2015—and 4000 for 2019—with the high intellect and good school education to allow performance at international standards at university.

These graduates of national high schools would come in two streams of roughly equal size.

The first stream would receive 4 years of education in national high schools, after completion of Grade 8 in other schools. The second stream would receive one

year of education in national high schools after completion of Grade 12 in other schools. The national Education Department would supervise a nation-wide examination after Grade 8, to select about 1500 students (later 2000) per annum to enter Grade 9-12 at the national high schools. The examination scripts would be sealed and examined centrally by the Department in Waigani. Half of the places would be allocated proportionately to the population of Districts of origin, to the students with the highest examination results in each District. The remainder of the scholarships would be allocated to students with the next best results on a national basis.

There would be another national examination of all students after Grade 12, structured in the same way as the Grade 8 examination. Students with the best results in this examination would be offered HECS loans to university. They would be free to use the loans at the university and for the course of their choice.

The top 1500 (later 2000) students from the majority of high schools that are not national high schools, if they had not been offered university HECS loans immediately on the basis of their Grade 12 examination results, would be offered places for year 12 at the national high schools. As with the entrants to national high schools after Grade 8, half of these places would be allocated proportionately to the population of Districts of origin, to the best-performing students in each District. The students who accepted offers to enter national high schools after Grade 12 examinations would repeat Grade 12 at a higher standard at the national high schools, and sit again for the national Grade 12 examination determining allocation of university HECS loans at the end of Grade 12.

It is recommended that the process of physical rehabilitation of the national high school buildings and supporting infrastructure begin immediately upon acceptance of the recommendations of this Review, with a view to taking in the first Grade 9 students at the beginning of 2011. Rehabilitation would proceed progressively over the next several years, and be completed in time for the first Grade 12 students in 2014. Grade 12 would take in students from high schools other than the national high schools for the first time in 2014.

The established, but mostly badly run down, national high schools are at Sogeri in Central Province, Port Moresby in National Capital, Keravat in East New Britain, Passam in East Sepik, Warwin in Morobe, and Aiyura in Eastern Highlands Province. (Port Moresby and Warwin National High Schools are more recent and have a better physical infrastructure). It is proposed that two new national high schools be established after the completion of the rehabilitation of existing schools, taking in their first students in 2015. Location could be determined at a later date on the basis of availability and cost of land and supporting infrastructure, reliable transport access and the achievement of a broad geographic spread of facilities across the country. One of the new National High Schools should be located in the Highlands, at a place with reasonable

urban infrastructure, reasonable personal security and secure availability of land. The winding down of activities of Ok Tedi Mining Limited from 2014 in the well-serviced town of Tabubil, and the development of Tabubil as a town in which education is the main industry, makes that a possible location for the second of the new national high schools.

The national high schools would have telecommunications, computing, electricity and library infrastructure to reasonable international standards. They would have excellent teachers, with Papua New Guinean teachers of demonstrated high quality being augmented by some international staff, especially in the early years. To teach and eventually hold leadership positions in the national high schools would be recognised as a mark of distinction within Papua New Guinea.

Each of the national high schools would have a continuing close relationship with one or other of the five universities. One person with academic credentials, funded by the national government, would have a full-time liaison role between the “guardian” university and the national high school. The liaison officer would work with the guardian university to keep a supervisory eye on academic standards, provide information to teachers and students on academic and career choices, and arrange for the leavening of teaching with occasional interaction with university students and staff.

Fees would be charged at a similar level to other Papua New Guinea high schools. Most students would be boarders at the national high schools, and fees would include a contribution to accommodation costs. It is desirable that students make some direct contribution to living costs by working in school food gardens. Fees for national high schools would be covered in full by a loan within the Higher Education Contribution Scheme.

It is recommended that the Australian Government support the rehabilitation and expansion of the national high school system, through assistance in administration to the Papua New Guinea Government from one of the State education Departments with experience in selective high schools, and through the underwriting of provision of high quality expatriate teachers where there are gaps in teacher availability from Papua New Guinea.

Selection for entry to universities would be on the basis of criteria established by each of the universities, under the general supervision of the revamped Commission for Higher Education. The allocations of HECS scholarships for university would be on the basis of results from Grade 12 examinations, and these examinations would be of central importance in university decisions on entry. There would be an alternative channel of entry for current students at certificate and diploma level in other tertiary institutions, or enrolled in distance learning programs. For them, high performance in other tertiary programs could

lead to assessment by and possible acceptance into degree programs at a university.

(VII) On Staff Conditions and Practices

We recommend to the State universities and the Papua New Guinea Government that the implementation of the reforms and the upgrading of conditions of employment for academic staff at State universities proposed by this Review be made the occasion for clarifying and restructuring the contractual relationship with academic staff. The restructuring would remove ambiguities in expectations of performance, and ensure that staff members perform according to contract. A new contract should be introduced for staff members with conditions substantially superior to those currently available to staff members who are engaged full time in teaching. Access to those superior conditions, and to any other increases in salary or improvements in conditions over time, should be conditional on acceptance of effective and firm monitoring of professional performance according to contract. The new contracts should have the following elements:

- (a) Tenure according to normal University practice in countries with reputations for high academic performance, with continued employment subject to rigorous reviews of performance.
- (b) The basic contract should provide for good remuneration, competitive by reasonable international standards, on the basis that, in the absence of explicit agreement to the contrary, 100% of a staff member's professional time will be spent on teaching in the University's programs, whether courses leading to standard degrees, diplomas, and certificates, or in executive and summer or distance education courses, or in administration of the university's academic programs. Agreement to undertake other activities should be granted readily for any activity of community repute applying the staff member's professional skills. Agreements to undertake other activities would involve explicit reductions of expectations of the proportion of a staff member's time that will be spent on teaching or student or academic administration, alongside proportionate reduction in salary. The "buyouts" of teaching and administration time could be for short or long periods, or be a permanent feature of a staff member's relationship to the university. Common bases of agreement on contracting for less than 100% of an academic staff member's time would be:
  - to undertake research funded explicitly by the University, or by other Papua New Guinea research institutions or universities, or the Papua New Guinea Research Fund, or the Australia Fund for Papua New Guinea Research, or other foreign research funding organisations or foreign research institutes or universities. The State universities would

maintain budgets for funding for research for high-performing academics with research interests and capacities, with some revenue from standard grants, fees and other income being identified for this purpose.

- to provide expertise commercially to Papua New Guinea or foreign governments, citizens, corporations, or to international development agencies, so long as the services draw on the staff member's professional expertise and are of good repute, or to the consultancy arms of the universities that are amongst the commercial activities of universities advised and supervised by the Commission for Higher Education. Common uses of such "buyouts" of teaching time would be for private practice for doctors and lawyers, and consultancies for academics in many fields.
- (c) The remuneration package should not usually contain direct provision of housing, which leads to arbitrary variations in remuneration across staff members according to the availability of housing at particular times, but should include housing allowances whether or not a staff member uses university housing. Universities should expand the availability of attractive university-owned housing on university campuses, and make this available to staff members at commercial rates. The abundant availability of housing on campus, albeit at commercial rentals, would enhance security and minimise transport time in an increasingly difficult urban environment in the bigger cities.

The academic staffing contracts would be rigorously enforced. Severe penalties would be attached to breach of contract, including suspension or termination of employment for repeated or severe breaches.

#### (VIII) On Research

It is recommended to Papua New Guinea universities and to the Papua New Guinea Government that the extreme research deficiency at Papua New Guinea universities be corrected gradually over the next decade, and in a way that does not disrupt progress in raising teaching standards.

This outcome can be achieved in the following ways.

First, opportunities should be found for qualified Papua New Guineans, whether or not staff members of Papua New Guinean universities, to undertake PhD programs in foreign universities. The Commission for Higher Education and the individual universities should work with foreign governments and universities to identify scholarships for Papua New Guineans to enter appropriate PhD programs at foreign universities. Foreign governments should be encouraged to focus scholarships on these opportunities, with scholarships for undergraduate



study being confined to courses that are important for Papua New Guinea development but not available within Papua New Guinea. As part of its coordinating role in relation to graduate study abroad, the Commission should develop a program of scholarship income supplements for university staff members who take leave to study abroad, and a set of rules for their application, to replace the established systems within which State universities provide leave on full pay for some staff members in studying abroad.

Second, when Papua New Guineans return home after completing a graduate degree abroad, and return to or enter the employment of a university (whether State or private), they should be given the opportunity to accept a half-time Post Doctoral Fellowship for a period of one to five years, alongside a part-time teaching position at the University. Funding for the part-time research position, together with an appropriate level of research funding, would be provided by the Commission for Higher Education from a Fund accumulated from a small levy on base grants to the universities. This facility would allow young academics to publish articles and books from their PhD research and to begin the development of a research and publication record, while starting or continuing a university teaching career.

Third, a Papua New Guinea Research Council would be established to administer a Papua New Guinea Research Fund, under the general supervision of the revamped Commission for Higher Education. It would make research grants to cover salary and research costs on a project and, for scholars of exceptional demonstrated research capacity, personal basis. The Council would make use of specialist panels of experts to evaluate research proposals and capacities. In the first instance, foreign researchers would play substantial roles in the specialist panels.

Fourth, it is recommended to the Papua New Guinea and Australian Governments, that funding and administrative support be provided for joint research between Australian and Papua New Guinea scholars. Suggestions for this support are made in (IX) below.

Fifth, the established specialist institutions, the IMR, NARI and NRI, should have access to the various research funding facilities that are being introduced for the universities. Without their separate identities as specialist research bodies being lost, their activities should be integrated more closely into those of the universities. It is suggested that NRI eventually become an autonomous Institute within the University of Papua New Guinea, undertaking research in the social sciences and humanities. Its brief would include research relevant to policy, embedded in sound social science research. Links, already strong but somewhat weaker than at times in the past, would be strengthened between the IMR and the University of Papua New Guinea. Links, currently weak to non-existent, would be enhanced between a stronger University of Natural Resources and

Environment and NARI. The Industrial Technology Research Institute, recommended by Papua New Guinea Vision 2050, should be established as an autonomous research institution within the University of Technology. Within this closer contact between the specialist research institutions and the corresponding universities, joint appointments, joint supervision of PhD students, joint research and part-time or full-time secondments would be encouraged and facilitated.

(vi) On Cooperation with Overseas Institutions

We recommend the establishment of formal, close, long-term cooperative arrangements between Papua New Guinea and international universities and other academic institutions. We recommend that the Australian Government provide support for such cooperation.

At the heart of the cooperation would be long-term twinning arrangements between each Papua New Guinea State university and one Australian university. We are aware of possible arrangements between pairs of universities that would have strong support on both sides, but would leave the twinning choices to the institutions concerned. The Australian twin would accept responsibility for providing advice and technical support in all areas where it is required. The twinning arrangements would be established as soon as possible and continue and be reviewed towards the end of the decade 2010-20.

In addition, partnerships would be encouraged on particular academic (both research and teaching) and some other activities at the level of individual Faculties and Departments, and for joint research between individual Australian and Papua New Guinean scholars. These sub-university partnerships would be built on established cooperative relationships of demonstrated effectiveness. Existing close working arrangements should continue and where possible be expanded; the established cooperation of the Australian Group of Eight universities through Australian Volunteers Abroad, funded by AusAID, is the outstanding example. Such established cooperative arrangements would qualify for additional support under the proposals in this Review.

(IX) Cooperation with Australian Institutions and Summary of Recommendations on Australian Government Assistance

We suggest the following seven areas of Australian government support for the Universities reform program, all to be conditional on the Papua New Guinea Government committing itself to a comprehensive program of reform that is designed effectively to raise the standard of university education to reasonable international standards by 2020:

- (a) Technical support (most importantly from the Australian Taxation Office) in the establishment of a Higher Education Contribution Scheme (HECS), and provision of half the required transitional funding

until such time as repayments of loans make a significant contribution to Papua New Guinea Government funding of university education. We envisage transitional outlays of \$22-24 million per annum that decline in value as PNG graduates start to make repayments to the loan scheme. We recommend that the Australian and Papua New Guinea Government's share the costs of the grants to support the scheme in the transitional years. The Australian cost would be about \$11-12 million per annum, declining over time.

- (b) Financial and administrative support for close, long-term cooperation between Papua New Guinea and Australian universities ("twinning arrangements"), directed at improvement of all administrative and academic functions.

Australian financial support would cover the full incremental cost of cooperation, including the replacement time of Australian university staff seconded to Papua New Guinea institutions, and of Papua New Guinea staff undertaking training and work experience in Australian universities.

Total costs of support for these cooperative arrangements may rise from \$A2-3 million per annum initially to \$6-8 million per annum when fully established.

- (c) Assistance to the revamping of the Commission for Higher Education, and to developing capacity in each of the Commission's roles. Total costs would be in the vicinity of \$A2 million in the first full year of operation and \$A4 million per annum when fully established.
- (d) Assistance to the development of a research capacity in Papua New Guinea universities, in two ways.

First, the establishment of an Australia Fund for Papua New Guinea Research. This would operate on the same basis as the Australian Centre for International Agricultural Research, supporting joint research in all fields between researchers based in Australian and Papua New Guinea institutions. The scheme would be administered at a high level (but not in relation to research content) by the Australian Centre for International Research (ACIAR), alongside but separately from its programs in rural development. ACIAR's role would be administrative and supervisory. Its quality control would take similar forms to quality control in its rural development research programs, amongst other things ensuring that funding would qualify as competitive research grants within the funding systems of the Australian Research Council. ACIAR's administrative and supervisory role would be supported by expert panels, supported by the Australian Department of Education

and the Australian Research Council There would be separate panels in the humanities and linguistics; the social sciences; mathematics and the physical sciences; the biological sciences and business; and Law. Joint research might be funded to the extent of \$A1-2 million in the first full year of operation to \$A6-8 million per annum when fully established, in addition to established ACIAR funding for joint research on rural development.

Second, expert support from the Australian Research Council in establishing expert panels for evaluating proposals for research funding by the Papua New Guinea Research Council. It would be desirable to integrate provision of expert advice on Papua New Guinea research panels with the panels supporting ACIAR in relation to the Australia Fund for Papua New Guinea Research. Funding requirements would be small.

- (e) Sharing equally with the Papua New Guinea Government the costs of participation of the University of Papua New Guinea through the School of Government in the Australia New Zealand School of Government. Australia's share of costs would be about \$A2 million per annum.
- (f) Assistance to the rehabilitation and expansion of the national high schools, through the provision of administrative support from one of the State Departments of Education, through sharing of costs of rehabilitation of the old national high schools and through underwriting the provision of high quality teachers in English, maths and science in the early years. Total Australian costs would be expected to be \$A2 million dollars per annum in the first full year of operation and up to \$6 million per annum when fully established. (It is recommended that Australia make some modest contribution to rehabilitation and capital costs and that Australia picks up expatriate and Papua New Guinea national teachers' costs).
- (g) It is recommended that the Australian Government seek opportunities to provide access to Papua New Guinea universities' telecommunications and information technology systems at marginal cost, in circumstances in which Australian infrastructure has or is developed in a way that generates a footprint that can be used by Papua New Guinea universities. The utilisation of such opportunities would have value for Papua New Guinea, without significant incremental cost to Australia.

The total cost to Australia would be in the range of \$20-30 million per annum through the ten-year life of the program 2011-20, with the composition of expenditure changing over time. If our draft recommendations were accepted in

full by the Papua New Guinea Government, the increased costs of Papua New Guinea Government commitments to the universities would be more than twice as large as the proposed Australian commitments.

These sums would be in addition to the current AusAID commitments to scholarships for Papua New Guineans, Australian volunteers and other support to the universities.

We suggest a re-orientation of the scholarships to support the universities reform. Total costs of Australian scholarships in 2009-10 are estimated at \$A16.8 million, being for 7 PhD scholarships, 54-56 Masters, 16 undergraduates, and 50 TAFE students.

We suggest that the scholarships allocations be concentrated on training of staff and potential staff members of universities and research institutions, mostly at PhD and some at Masters level. For established staff members of Papua New Guinea universities and research organisations, scholarship costs will need to include some family living allowances. Undergraduate scholarships for study in Australia should be focused narrowly on areas of expertise of importance to Papua New Guinea development in which no courses are available in Papua New Guinea, and coordinated through the revamped Commission for Higher Education. TAFE training should be concentrated in Papua New Guinea.

We have recommended that the Papua New Guinea Government, through the Commission for Higher Education, and the University of Natural Resources and Environment, conduct a feasibility study on the elevation of that university to international standards of teaching and research in the biological and social sciences related to rural development. If, following that feasibility study, the Papua New Guinea commits itself to rebuilding the University of Natural Resources and Environment to high standards, and makes major additional financial commitments to that task, we recommend that the Australian Government consider providing additional assistance for that purpose.