



EMPLOYMENT, EDUCATION AND
SKILLS DEVELOPMENT IN PAPUA
NEW GUINEA



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Foreword

In 1992 the UNDP/ILO commissioned a major review of Employment and Human Resource Development in PNG. 1992 was the year that oil first flowed from the Kutubu field in the Southern Highlands and, combined with new mines, there were expectations of a major mineral boom about to transform PNG's economy. In reality the 1990s were a period of missed opportunity, with severe economic mismanagement and instability undermining business and investment, and with it employment. It was a decade when, with little reform or restructuring of the public sector, combined with some unproductive expenditure and revenue shortfalls, funding and mechanisms for the provision of public goods, particularly basic services at the provincial levels, were severely disrupted. This badly undermined public infrastructure and services, with decaying roads to schools and colleges, high interest and inflation rates in turn reducing incentives to produce for market or employ extra staff (despite liberalised wage rates), whilst human resource development from primary education through to institutions, such as technical colleges, were sidelined and failed to keep pace with population growth.

The UNDP/ILO report (released in 1993) highlighted many of the issues, including dangers associated with unrealistic expectations from the supposed mineral boom, undermining sound macro-economic management and fiscal restraint, including the need to focus upon priority expenditure. Successive Governments in the 1990s, and it was a period of political instability and short duration administrations, would have done well to heed the findings of the 1993 report, and particularly the need for focus upon sustaining suitable conditions for employment growth and investment in Human Resource Development, but the report remained largely hidden on dusty Departmental shelves, whilst Government focussed upon matters of the moment, including the series of fiscal and foreign exchange, as well as political, crises.

The 1992 review was headed by Anne Booth, Professor of Economics at London University's School of Oriental and African Studies, who had formerly served an extensive term with the Australian National University.

In 2008, with another prospective natural resource boom on the horizon, driven by LNG and mineral development, the Institute of National Affairs (INA) decided to undertake both a modest employment and training survey of formal sector employers and a wider assessment of the status quo with respect to employment and human resource development. This would particularly highlight the needs of the country's growing population, issues affecting different sectors, as well as assessing the prospects and risks associated with the recent faster recent economic growth and further potential from enclave-based resource development.

With valued support from the New Zealand High Commission and Asian Development Bank, the Institute commissioned Professor Booth to revisit her earlier work from 1992 and, during a brief stay in the country, including both an intensive programme of consultations and desk review of literature and available statistics, to assess the situation

prevailing in 2009 and into the near future. The task was daunting, as Papua New Guinea's hitherto rigorous system of statistical collection has been allowed to wither, through lack of resources, awareness and interest by respective Authorities. Therefore, apart from various localised surveys and anecdotal evidence, the 2000 National Census provides the last rigorous source of employment data. Indeed, sadly it appears that the next 10 yearly Census will be deferred until 2011, deferring the availability of further data until about 2012/13 and reducing its value for analysing historical and international comparisons.

Professor Booth highlighted to those in government the need for reliable data, including the value of inter-censal surveys to gauge trends on priority issues, midway between the full Censuses. Papua New Guinea is fortunate that its Central Bank maintains a competent economic statistical section which provides an invaluable source of data, including useful surveys, such upon employment trends. It is not, however, the Bank of PNG's core role to provide comprehensive economic data, let alone demographic and social data, and it is crucial that the National Government, supported by development partners, take this issue seriously and ensure that the National Statistical Office (and other sectoral Statistical units) are both adequately resourced, and that the output is effectively utilised within the government planning system, including by bodies responsible for education and higher education/training, and accessible to the private sector for their needs.

During discussions with government, the Planning Secretary, Mr Joseph Lelang, stated that he'd commenced his career in a vibrant former 'Manpower' Unit in the Planning Department in the early 1990s. He made a commitment to re-establishing such an Human Resource Development unit, or capacity within the Department and better utilise data on the growing population and prospective workforce into planning for investment in education and training. This will be valuable. The days, however, of central planning are long gone, even in former command economies, like China and Russia. The Government does need to plan, but the current Medium Term Development Strategy (MTDS 2005-2010) recognises the primary role of the private sector in driving growth. Training and employment generation entail government, private sector and civil society (including churches) working in partnership, but with certain clear responsibilities falling on Government, for example in ensuring standards and the achievement of policy goals, such as universal primary education, and dispersal of opportunities away from a few enclave industries and wealthy towns and provinces and into the wider community for broad-based economic and social development.

The Government institutions related to higher education and technical and vocational training suffer unclear delineation of responsibilities, leading to poor coordination and limited fire-power in accessing resources. A few private sector and donor funded technical training facilities are clearly well resourced, in stark contrast to the long-forgotten public institutions; a situation which needs to be addressed promptly. Prof Booth highlights that education is not under-resourced in relation to comparable developing countries (in terms of allocation to GDP), however the expenditure is clearly not being effectively used; an issue which has been subject to various tracking studies by

NEFC, the World Bank/NRI and other institutions, highlighting wastage and inefficiencies, which need to be addressed. Geographical, historical and cultural factors may raise costs, but attention is required on effective utilisation and oversight of public funds, and ensuring that they are effectively prioritised and coordinated, with waste and misuse avoided (whether in terms of absentee teachers, or use of functional grants expended on unrelated expenditure, for example).

It is hoped that Prof. Booth's short report, will be readily accessible and widely read, and perhaps therefore better able to contribute to policy-making over the next few years, including through the various medium and longer term National and sectoral development strategies currently being drafted by different arms of Government.

Paul Barker
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Institute of National Affairs
12 October 2009



Employment, Educations and Skills Development in Papua New Guinea

Anne Booth

The PNG Paradox

Papua New Guinea (PNG) is frequently viewed as a resource-rich but under-performing economy which has made little progress since Independence in utilizing its natural resource wealth to improve living standards of the population. It was ranked 139 out of 177 countries in the United Nations Human Development Index in 2004; this was 15 below its ranking on per capita GDP alone (UNDP 2006: 284-5). In terms of per capita GDP, PNG is according to some estimates above, or similar to, several of its Pacific and Southeast Asian neighbours such as the Solomons, Cambodia and Laos. But the HDI ranking in 2004 was below that of these and most other Asian and several African economies; it was, for example, below Nepal, Bangladesh and Ghana. PNG continues to perform badly on indicators such as life expectancy; literacy and school enrolments compared to many other countries with the same or lower GDP per capita¹.

The reasons for this performance are complex, and lie in PNG's unusual, even unique history. While parts of the country have been exposed to outside economic and

¹ The reasons for the poor performance of the educational sector are especially striking as the country spends a much larger share of GDP on education than most other countries in the Asian region. The share was estimated to be almost eight per cent in 2003 (Asian Development Bank 2008: 44).

cultural influences since at least the latter part of the 19th century, other parts of the country, notably the highland region, were only opened up to the outside world in the early and middle decades of the 20th century. At the time of independence from Australia, much of the population was illiterate, with no formal schooling and little exposure to modern science and technology. Since independence, this situation has changed and the country possesses many more professional, technical, and managerial workers than 40 years ago. Many people, even those with little or no formal education living in remote regions, have responded rapidly to new opportunities which exposure to national and international markets have brought. New cash crops have been grown in many parts of the economy, and new technologies in transport and telecommunications have been adopted, often with surprising rapidity.

But these changes, although rapid, have not been enough to allow PNG to catch up with neighbouring countries in terms of education and skills development. Population growth has been fast, and is probably now around three per cent per annum, which means it is doubling about every 23 years². This has produced a population structure tilted towards the younger age groups; the 2000 Population Census found that around half the population was under the age of 20 (2.6 million out of 5.2 million). This places huge burdens on an education system which is still struggling to achieve universal basic education (one of the Millennium Development Goals), let alone improve access to

² The 1990 Census did not enumerate the province of North Solomons, and it is likely that other provinces were under-enumerated, especially in the highlands. The National Statistical Office estimated a population growth rate based on the 1980 and 2000 censuses of around 2.7 per cent per annum. But as infant mortality has fallen since 1980, it is likely that population growth accelerated over the 1990s.

education and training at higher levels. It also places strains on maternal, infant and child health delivery, and there is doubt that the millennium goals relating to declines in under-five mortality and maternal mortality can be met³.

This report will review progress in education, employment and skills development, with particular emphasis on the period since 1990. It uses data from the 2000 Population Census, which was the last comprehensive source on employment, and education and skills for the country as a whole. It also draws on evidence from more restricted surveys carried out since 2000.

Changes in Output and Employment in the PNG Economy since 1990

It is widely believed that per capita GDP and per capita national income have changed little since independence, although the evidence is mixed. At least one widely used data source does show some growth, especially after 1990, although these estimates use a rather lower rate of population growth than that derived from the census estimates (Table 1). What is clear is that as a small open economy dependent on exports of agricultural products and minerals, PNG has been subject to considerable volatility in the terms of trade and this has made macro-economic management difficult. The impact of terms of trade volatility on employment is difficult to judge, for reasons which will be discussed further below. It is also difficult to predict the impact of the acceleration in GDP growth which has taken place since the early 2000s. Assuming a population growth

³ See **The National**, July 15, 2009 and on maternal mortality rates, Bakker (2009)

of 2.7 per cent, per capita GDP has increased by around eight percent between 2003 and 2009. Per capita GNE (Gross National Expenditure) also increased after 2003, although it was lower in 2006 than in 2000. This was also the case with the private consumption component of GDP (Table 2). The rates of increase in these aggregates are obviously rather lower if a higher rate of population growth is used.

If we look at sectoral contributions to growth of GDP in recent years, it would seem that agriculture, mining and, especially in 2006 and 2007 construction, have made the largest contributions to growth (Table 3). Robust growth in the agricultural sector is important for both employment and productivity growth in PNG because this sector is by far the largest employer of labour in the economy. By contrast, growth based mainly on mining, manufacturing and construction, is unlikely to have a dramatic impact on employment, because these sectors are capital-intensive and employ only a small percentage of the labour force. According to the 2000 census, these sectors accounted for under five per cent of total employment, while the agricultural sector accounted for over 70 per cent, and services 24 per cent (Table 4).

Over the 1990s, relative labour productivities (the ratio of output per worker in a particular sector relative to the whole economy) in agriculture did not change much, but productivity was only around 40 per cent of the national average. Relative labour productivity fell in services, but was still above the national average (Table 4). Although a significant part of GDP growth in the next few years is projected to come from mining, construction and transport, it will be output growth in agriculture and services which will

be crucial in determining trends in relative labour productivities, because they will continue to be the largest employers of labour. If output in these sectors does not show robust growth, the disparities in labour productivity shown in Table 4 will widen. This in turn will have important consequences for urban-rural and regional disparities in incomes and living standards, which will be explored further below.

The Changing Structure of the PNG Labour Force: What the Census Data Show

The available evidence indicates that the growth of the labour force in PNG since Independence has been at least as fast as population growth, and possibly faster. Over the 1980s, the labour force grew by around three per cent per annum, according to figures from the 1980 and 1990 censuses, although given problems of comparability this estimate must be treated with caution (UNDP/ILO 1993: 6-7). In the decade of the 1990s, labour force growth was slightly more than three per cent per annum. The female labour force grew twice as fast as the male labour force between 1990 and 2000, although this could reflect some under-counting in 1990 (Table 5). The total labour force participation rate, which was estimated to be 69 per cent of the population over 10 years in 1990, did not change much between the two censuses; it was estimated to be 67.5 per cent in 2000 (Table 6). But this apparent stability masked considerable changes by gender. Between the two censuses, female labour force participation rates have increased and male rates have dropped sharply, from 77 to 68 per cent. In 2000, there was very little difference between male and female labour force participation rates.

The relatively high female participation rates in PNG reflect the fact that most women have access to agricultural land and are responsible for growing food for the household. Men have traditionally been engaged in cash agriculture, and in non-agricultural activities. How can we explain the sharp decline which has apparently taken place in male labour force participation rates between 1990 and 2000? The figures show that many men withdrew from the labour force into the “housework” and “other” categories. What does this really mean? Are they discouraged workers, who have given up looking for work because they do not think that jobs are available? Have they withdrawn through ill health? Or do the figures imply that more men are shifting into illegal activities, which are not included in conventional labour force estimates?

The survey carried out by Levantis in 1995 highlighted the attraction of illegal activities for young people in urban areas. He estimated that around 32,000 people in urban areas, almost 15 per cent of the urban labour force, were involved in some form of criminal activity (Levantis 1997). The earnings of young people in particular from criminal activity were found to be as high, if not higher, than earnings from wage employment, which was not always available to the young unskilled. Criminal activity, especially prostitution, was also widespread among young women in urban areas, and increasingly was seen by the authorities as contributing to the spread of AIDS. The extent to which the 2000 Census failed adequately to catch employment in illegal activities will be investigated further below.

Agricultural Employment

Agriculture, whether for subsistence or for cash, has always been, and continues to be, the main source of employment for the great majority of people in PNG. In 2000, the census found that 58.2 per cent of the male labour force was employed in subsistence agriculture and 73.3 per cent of the female labour force. A further 9.3 per cent of the male labour force was employed in cash agriculture and 9.7 per cent of the female labour force (Tables 7 and 8). What was surprising was the apparent very sharp decline in the percentage of both the male and the female labour force employed in cash agriculture between 1990 and 2000, and the corresponding increase in those employed in subsistence agriculture. This reversed a trend towards greater participation in the cash economy between 1970 and 1990 (Table 9). Why was this?

It is possible that at least part of the decline between the two censuses might have been the result of different enumeration procedures; the questions might have been posed in different ways, or the definitions of cash and subsistence might have changed. Given the magnitude of the change, these explanations cannot be ruled out⁴. But other reasons are also possible. First, lower world prices for coffee, cocoa and copra, could have made cultivation less attractive. Lower world prices should have been offset to some extent by depreciation of the kina, which would increase the kina price of export crops, but would also have increased the cost of inputs. One recent study which examined the profitability of export crops in PNG has argued that most faced declining profitability over the last

⁴ It is possible that the terms 'subsistence' and 'food crop' were used interchangeably in the census, although increasingly food crop production may be oriented to the market.

three decades. This was the result of increasing domestic costs and trade policy which in effect taxed export producers (NZIER 2006: 74).

Another reason for the decline in employment in cash crop agriculture is the deteriorating quality of infrastructure, especially roads, which in some regions could have encouraged producers to abandon production for the market altogether. In addition, the quality of extension services for farmers might also have declined. Farmers faced with problems, such as the recent cocoa pod borer attacks, have not always received timely advice on how to deal with plant pest or disease or other cultivation problems. This in turn could have forced many cultivators to abandon cash agriculture and move back to cultivation of food crops for household consumption. Last but by no means least, the declining number of banks in many provinces has meant that many agricultural producers have no access to banking services⁵.

The switch back to food crop production over the 1990s could also have reflected rational responses on the part of many producers to market signals. It has been argued that since the mid-1990s, the devaluation of the kina has encouraged many households in PNG to consume less imported food and more locally produced staples, especially sweet potato. By 2006, 83 per cent of food energy consumed in PNG was estimated to have been locally produced. Subsistence food output was keeping up with population growth, while per capita consumption of imported foods was declining (Bourke 2009). To the extent

⁵ In a speech to the National Development Forum in July 2009, the Governor of the Bank of Papua New Guinea admitted that the financial services available to agricultural producers were 'dismal' (**The National**, Thursday August 6)

that these trends are continuing, it is possible that the shift in agricultural employment away from cash and back to subsistence food crops will continue in coming years.

Trends in the Wage Labour Force

Over the 1980s, few policy issues in PNG were debated as intensively as the minimum wage policy, and the regulation of the wage labour market which had been inherited from the Australian colonial era⁶. In August 1992, the government responded to criticisms of the system with a substantial deregulation of urban labour markets, including a reduction in urban minimum wages (UNDP/ILO 1993: 57). Advocates of labour market deregulation predicted a strong positive effect on wage employment growth of the 1992 reforms. Levantis (2000; 22-23) used the BPNG data to argue that the 1992 reforms were a 'resounding success' for employment growth especially in urban areas. The 2000 Census data did not entirely confirm this argument. The census showed some growth in wage employment over the 1990s, although it was not very rapid, and entirely due to growth in women wage workers (Table 5).

The more rapid growth of women wage workers compared with men continues a trend which was already clear during the 1980s, (UNDP/ILO 1993: 18-20). It is probable that women benefited from the growth in wage employment opportunities in the service sector, including retail trade, financial services and personal services. The employment data collected by the Bank of Papua New Guinea indicates some employment growth in

⁶ See UNDP/ILO (1993: 53-57) for a summary of the debate.

these sectors between 1992 and 2000, and a decline in employment in large-scale agriculture, transport and construction; the labour force in all these sectors would have been largely male (Bank of Papua New Guinea 2009: S53). It is likely that after the reforms many employers dismissed or retired older male workers who had been hired at pre-1992 wages, and did not replace them.

In interpreting the 2000 Census data on wage employment, the conditions in the economy in the latter part of the 1990s need to be borne in mind. Although some growth in GDP did occur, the period after 1994 was marked by considerable political instability. The failure to resolve the Bougainville dispute, culminating in the Sandline affair, received considerable international attention and contributed to the view that PNG was becoming, if not a 'failed State', at least one with intractable problems of governance. Also contributing to this view was the obvious increase in political and administrative corruption; one observer argued that by 1999, PNG had become a 'kleptocratic state' (Garnaut 2000: 33). This inevitably affected the investment climate, and thus the growth of wage employment opportunities in both urban and rural areas.

Trends in unemployment, 1990-2000

In 2000, 4.3 per cent of the male labour force and 1.3 per cent of the female labour force were classified as unemployed (defined as not working and actively seeking work). The percentages were much higher in urban areas (19.4 per cent of the male labour force and 10.2 per cent of the female labour force). For both males and females

there was a substantial decline in unemployment rates compared with 1990 (Table 10). It seems probable that the withdrawal of discouraged workers from the labour force was a factor contributing to the fall in unemployment. It could also reflect the movement of more young people in particular into criminal activity, and not being recorded as in the labour force at all. It is also possible that the new category of “unpaid family worker”, which was added in 2000, could have included people who in 1990 might have been classified as unemployed.

In 1990, around 70 per cent of the unemployed were under the age of 25, and 49 per cent were in urban areas (UNDP/ILO 1993: 17). The proportion in urban areas has increased only slightly but the percentage under 25 has dropped to 51 per cent (Table 11). Open unemployment is thus much less a youth problem than it was in 1990. On the other hand the 2000 Census registered large numbers in the “other” and “unclassified” categories, many of whom were under 25 (Table 12). This was especially the case with those in the “not-stated” category, almost 75 per cent of whom were under 25. It is probable that most of these young people were not in education or the labour force but confused as to which category they should be included. It is likely that many were either discouraged workers or engaged in illegal activities, as Levantis (1997) argued. More detailed labour force surveys are needed to throw more light on this issue, but in the meantime it is clear that the unemployment data from the 2000 Census have to be treated with considerable caution.

Educational Progress

Many people have been critical of the educational system in PNG, both in terms of the numbers educated and in terms of quality, and there is a widespread perception that facilities have deteriorated since the 1980s. The Education Sector Review of 1991 recommended a pre-primary level of three years during which children would be taught in their local language, before moving to a primary cycle taught in English⁷. The implementation of this policy has proven controversial, but the 1990 and 2000 Census data do indicate that in the 5-9 age groups, enrolment ratios increased from 14.3 per cent to 21.9 percent of the age group. The rate of growth of enrolments at this level was slightly higher for girls than for boys. In the 10-14 age groups, the enrolment ratio increased only slightly, from 53.5 to 54.2 per cent. In the 15-19 age groups, the increase was more pronounced, from 22.5 to 33.8 per cent (Table 13).

While these achievements are to be applauded, it is clear that large numbers of young people were not in formal education at the time of the 2000 Census, and that a high proportion of the total population over five years (around half) had had no formal schooling at all. This was reflected in the national literacy rate of 56.2 per cent which, while an improvement over the 1990 figure of 45.1 per cent was still low by regional standards. Furthermore, there were very considerable differences between provinces in both educational indicators and literacy rates. While only 11 per cent of the population over five years in Manus had never been to school and 17 per cent in East New Britain,

⁷ For a discussion of the recommendations of the 1991 review see UNDP/ILO (1993: 137-41).

the figure was round 78 per cent in the Southern Highlands province and in Enga. Similar disparities were apparent in literacy rates which ranged from 90.7 per cent in the National Capital District to 35 per cent in Enga. These disparities are also reflected in other social and economic indicators which are reviewed below.

The figures on literacy, educational enrolments and educational attainment of the adult labour force, while indicating improvement, have worrying implications for PNG, especially as the country struggles to improve both school attendance ratios, and the skill levels of the post-school population. It is unlikely given the 2000 figures that universal basic education (UBE) will be achieved by 2015. In 2000, 26,941 people were described as teachers in the Census, of whom 16,858 were men and 10,083 were women. This amounted to 71 children and young people aged 15 to 19 for every teacher in 2000. Clearly numbers would have to at least double if the UBE goal were to be reached by 2015. The Treasury appears to have ruled out such an increase, on the grounds that budget constraints make the hiring of the required number of additional teachers impossible, let alone the provision of new infrastructure in remote regions of the country.

It is widely acknowledged that the education sector is beset by problems of efficiency and management coordination. Stories abound of wastage, including the payment of ghost teachers, and also of a reluctance to work in remote areas, especially on the part of women. Provinces have responsibility for the construction and maintenance of schools and the payment of teachers (although salaries are set nationally), but lack the funds. Teacher violence is not uncommon; along with fees, this is often cited as a cause

of high student dropouts. But in spite of all these problems, programs such as SLIP (School Learning Improvement Program) have demonstrated in Manus and East New Britain that 100 per cent enrolment ratios can be reached with little extra outlays of government funds. The main challenge is to get strong community involvement in the maintenance of school buildings, and in the monitoring of both teacher and student behaviour.

Skill levels in the population

The 2000 Census contained quite detailed information on the post-secondary qualifications of the citizen population over the age of fifteen who were not attending school. The total number of PNG citizens over 15 years and no longer in formal education with qualifications was 147,328. This amounted to 5.3 per cent of the population over 15 years (7.1 per cent of the male population and 3.4 per cent of women). Traditional gender divisions were obvious; men dominated in vocational, technical and trade skills, while women outnumbered men in qualifications relating to health, business and secretarial practice (Table 14). The numbers possessing vocational, technical and trade skills (29,300) amounted to around one per cent of the population, which was only slightly more than the numbers with college and university qualifications (23,165). The distribution of people with qualifications was very skewed by region; almost half were in five provinces (NCD, Morobe, East New Britain, Madang and the Western Highlands). Over 40 per cent were in urban areas.

The 2000 Census reported that almost 189,000 people over 15 and not attending school with Grade 10 to 12 education had no further qualifications (National Statistical Office 2002: 34). While some of these people could have acquired skills after 2000, it is likely that many have been unable to progress with their education perhaps for financial reasons or perhaps because they were unable to gain admission to post-secondary courses. They represent a considerable loss to an economy which is already critically short of technical and vocational workers.

Regional Disparities in Life Expectancy, Education and Economic Potential; Evidence from the 2000 Census

Information from the 2000 Census reveal very large disparities by province in most economic, educational and demographic indicators. This is hardly surprising, given the many studies which have been made of regional and rural development in PNG over the decades, all of which have demonstrated large regional differences in levels of development⁸. The disparities in literacy and school attendance have already been noted. Infant mortality rates varied from 22 per thousand in the NCD to 105 per thousand in West Sepik; there were also considerable differences in life expectancies. The percentage of the population over 15 with skills varied from three per cent in Enga to 17.8 per cent in

⁸ An excellent recent summary of this literature is given in Allen, Bourke and Gibson (2005). These authors point out that differential in poverty across PNG was evident in patterns of inequality that existed even before the advent of colonialism. According to their argument, much of the poverty is related to isolation, and lack of infrastructure.

the NCD. The percentage of the labour force engaged in monetary activities varied from less than 12 per cent in the Southern Highlands to 89 per cent in the NCD⁹.

These indicators can be weighted into an HDI-type index for each province in the country; the results are shown in Table 15¹⁰. The NCD has the highest ranking by quite a wide margin, followed by East New Britain, Manus and New Ireland. The lowest ranked provinces are West Sepik and Enga. While there is some correlation between the overall index and the index of economic potential, there are several outliers. Milne Bay and Northern provinces are ranked lower on economic potential than on life expectancy and literacy/educational indicators, while the opposite is the case in provinces such as West Highlands and Morobe. The considerable disparities in these indicators across provinces no doubt reflect a mix of historical and cultural influences on development in the regions of PNG. But it is difficult to escape the conclusion that the NCD is becoming a ghetto of privilege, with little in common with the rest of the country. This may be the result of selective in-migration; many young people with some educational qualifications who find few economic opportunities in their home region move to the NCD in the hope of finding employment. If they fail, it is likely that in many cases they move into illegal and criminal activity.

⁹ Since 2000, intakes in Enga province have improved as a result of increased financial commitment from the provincial government, including free or subsidised primary school places. The Education Department has also reported improved school performance in Enga.

¹⁰ The Human Development Index contains a per capita GDP component; as provincial GDP data are not available in PNG, the index shown in Table 15 contains an 'index of economic potential' based on the percentage of the population engaged in monetary activities and the percentage with skills acquired beyond secondary education.

Current developments in employment and emerging problems in the provision of skilled workers

The 2000 Population Census is a valuable source of data on many aspects of employment and skills development in PNG, and will serve as a baseline from which to estimate progress over the 21st century. But it is already nine years out of date, and thus less useful as a guide to recent developments in the labour force. Unfortunately, in the absence of labour force surveys with national coverage, there will be no further information on labour force trends until the next census takes place, and results from that census may not be available until 2013. The only other regular survey-based source of information on employment trends is from the Bank of PNG, which publishes quarterly data on employment trends, based on responses from 500 large, medium and small enterprises. The survey thus shows growth mainly in the wage labour force. Since 2002, these data indicate that employment growth appears to have been robust in most sectors, with especially fast growth in wholesale trade, building and construction, and manufacturing. This suggests that growth in wage employment has been quite rapid since 2002. But the growth is from a small base, given that wage employment accounted for only 14.6 of the male labour force in 2000, and 5.2 per cent of the female labour force.

It should also be noted that the fast-growing sectors in terms of employment according to the BPNG surveys only accounted for a small percentage of the total labour force in 2000, and rapid growth in wage employment in these sectors will probably only affect urban labour markets for skilled and semi-skilled workers. Given that these markets are still quite small, the impact of increased demand on wages is likely to be

considerable. It was clear from interviews conducted with a range of informants in both the public and private sectors in Port Moresby in July 2009 that many employers are facing serious problems in recruiting and retaining skilled workers, especially in areas such as accounting, financial management and IT. These shortages are inevitably leading to increased job-hopping and poaching¹¹. This may affect the willingness of para-statal and private firms to carry out staff training programs, or to send staff abroad for long periods, if they are likely to switch employers after they return.

Another even more severe problem relates to technical and vocational education and training (TVET). Problems in this sector were already obvious by the late 1980s, and TVET was the subject of several reports, including one by GTZ¹². Over the past fifteen years, TVET education has experienced a further deterioration in facilities, even as the demand for such education has increased. New projects in the mining sector, including the large potential LNG project(s), will create thousands of jobs in the construction phase, which will make huge demands on the existing small pool of workers with technical and vocational skills (Esso Highlands estimate six to seven thousand jobs will be created). Companies involved in the gas projects feel a strong compulsion to recruit and train labour from around the project site, or the footprint of the project in the case of the pipeline, and most have, or plan to implement, training programs in areas such as

¹¹ For example, when the Irish firm Digicel won the contract to establish a second mobile phone network, it hired a number of skilled engineers and technicians from the state enterprise which hitherto held a monopoly in the provision of phone services.

¹² See UNDP/ILO (1993) especially chapter 6 for a review of the problems facing the TVE sector in the 1980s. Most of the problems noted in that report have persisted.

building, welding, and heavy equipment operation¹³. But mining is a capital-intensive business and it is unrealistic to expect that this sector will create more than a few thousand regular jobs over the next five years. It is also probable that more non-citizens will have to be recruited to fill skilled professional, technical and administrative positions, in mining and in other sectors of the economy.

According to the Department of Labour and Industrial Relations, around 30,000 work permits have been issued and are currently valid, although it is not clear that all these permits have been taken up. Many expatriate workers currently in PNG are from other parts of Asia, including China, the Philippines, Malaysia, Indonesia and India as well as from Australia, New Zealand, the UK and the USA¹⁴. In the early 1990s, the great majority had only secondary education and were mainly engaged in technical and managerial tasks (UNDP/ILO 1993: 218-19). Whether this is still the case is unclear; certainly it is government policy now to grant work permits only to those with post-secondary qualifications and skills which are in scarce supply within the domestic economy.

Can the agricultural sector absorb more labour?

Given that numbers in the working age groups in PNG are in all probability growing at around three per cent per annum, the challenge of creating productive employment is a

¹³ Ok Tedi Mine, now largely owned by the PNG Sustainable Development Program Limited and the PNG government, has a training program and advertises training opportunities in the national press. In recent years, the mine has employed around 2,000 people, of whom 95 per cent are PNG citizens.

¹⁴ It is widely reported that many workers are in PNG illegally, without the required work permits. Most are probably from Indonesia, China and other Asian countries.

formidable one. The agricultural sector has been the major employment provider in PNG since Independence. Absolute numbers employed in agriculture, both cash and subsistence, continue to grow. While rough estimates based on the 1990 and 2000 Censuses and National Income data suggest that productivity per worker in agriculture, relative to the national average, stayed constant between 1990 and 2000, this is not guaranteed to continue in the future, especially if the agricultural population continues to grow rapidly. As has already been noted, the national accounts data show that growth in agricultural output since 2002 has been much slower than the national average, so it is likely that over the decade 2000-2010, output per worker in agriculture will fall further behind output per worker in other parts of the economy.

Historically, in most parts of the Asia-Pacific region, growing populations in agriculture have been accommodated through extending the land frontier, although in the more densely settled parts of East and Southeast Asia, existing land began to be more intensively cropped, especially through the use of irrigation. In PNG, the evidence from land use intensity mapping has shown “strong evidence” that the total area used for village-based crop production expanded between 1975 and 1996 at a slower rate than the growth of rural population (McAlpine and Freyne 2001: 218). This indicates that a process of agricultural intensification has been underway for decades, if not longer. How much further can this process continue without sharp falls in output both per unit of land and per person? Bourke (2001) has pointed out that the main intensification techniques in PNG have been the adoption of more productive staple crops (in particular sweet potato, cassava, maize and taro) and the adoption of more productive cultivars of banana and

sweet potato. In addition shorter fallow periods have been adopted and greater use of manures.

Unlike in many parts of Asia, Bourke (2001: 232) has argued that irrigation plays only a very minor role in PNG agriculture; in many regions excessive moisture is already a hazard. The neglect of irrigation is also the result of the widespread cultivation of crops such as cassava and sweet potato which can tolerate mild water stress; it also reflects a growth in reliance on imported foods after independence, which gave many rural people a perhaps false sense of food security. As we have seen, this reliance on food imports has fallen since the mid-1990s in most parts of the country as a result of the depreciation of the kina, which has made imported foods such as rice more expensive relative to home-produced staples, whose importance has increased in most local diets. Whether this process can continue in part depends on the capacity of villagers to continue producing more crops on currently cultivated land; Bourke (2001: 233) suggests that the process of intensification is slowing down in most rural areas.

Another problem for both food crop and cash crop agriculture is that, since the early 2000s, the real appreciation of the kina seems to have produced the familiar “Dutch Disease” pressures on the non-mineral traded goods sector, which in PNG is mainly agriculture. Producers of cash crops such as coffee, palm oil and other tradables have had to face declining kina returns as the real exchange rate appreciates. In addition, food crop producers who benefited from the depreciation of the kina over the 1990s (which made imported food products such as rice more expensive) may find that a real appreciation of

the kina will reduce the competitiveness of crops such as sweet potato, fish, vegetables and bananas vis-à-vis imported foods such as rice. Bourke (2009) has argued that both export crops, such as oil palm and hardwoods, and fast growing timbers such as balsa and domestic food crops, including root crops and bananas, all face good market prospects, and in 2007 still offered attractive kina returns per person-day. But a further sharp real appreciation of the kina could reduce these returns, with important implications for income distribution and rural poverty.

What other sectors can absorb a growing labour force?

It has already been pointed out that, although the mining sector might have become the leading sector driving GDP growth over the past few years, it is highly capital intensive; in 2000 the sector only employed 0.4 per cent of the labour force, and this percentage is unlikely to change much in coming years. Other sectors which have grown quite fast in recent years, at least partly as a result of the growth in the mining sector, include manufacturing, utilities and construction. These, however, are also not major employers of labour; these sectors together only accounted for 3.2 per cent of employment in 2000. The second largest sector in terms of employment after agriculture is wholesale and retail trade, which accounted for 15 per cent of the labour force in 2000. Much of the output in this sector, and in community and personal services is non-traded, in the sense that prices are determined by domestic supply and demand factors and any increase in demand has to be supplied from domestic sources. Thus demand for these services will certainly grow if GDP continues to expand. Small-scale trading activities

have the greatest potential for employment generation in the short-term and do not need highly educated workers. But national and local governments will need to provide more secure environments where trading activities can take place, and improved transport infrastructure so that goods can be moved to markets quickly and cheaply.

Demand for labour in the construction sector will also grow, but the impact on domestic employment may be reduced because of skills shortages, which firms may have to meet through expatriate workers. It is regrettable but undeniable that the long-term neglect of technical and vocational education in PNG has created a situation where a large jump in demand for skilled workers in the building trades cannot be met from domestic sources. Health, education, security and community services will also face growing demand; these sectors may also have to meet skills shortages through greater reliance on expatriate workers, at least in the short-term. It is also likely that the private sector share of output and employment in sectors such as health and education will grow. Private providers can pay higher salaries, and will cream off the best of the locally available teachers and health workers, creating even greater shortages in the public sector.

Towards a Human Resource-led Development Strategy for PNG

(1) Focus on agriculture:

Given the continuing importance of agriculture as a source of employment in the PNG economy, and given the problems which the sector will face if a resources boom leads to

a prolonged real appreciation of the kina, the sector should be the main focus of any employment-oriented development strategy in PNG. As Duncan (2000: 41) argued:

More rapid agricultural growth generates more demand for domestically-produced goods and services and increases non-farm rural employment as well as urban employment. So faster agricultural growth should help relieve the urban unemployment situation too and reduce the urban drift.

Designing an appropriate agricultural sector policy in PNG over the next decade will not be easy, given that the scope for intensification is limited and a real appreciation of the kina will place local producers under cost pressures. There may have to be some degree of assistance for those components of the sector which have the best potential for generating productive employment. Such assistance should include better research and extension facilities devoted to both food crops and cash crops. In addition the complex issues relating to land tenure will need to be addressed so that land is available to those who can make the most profitable use of it. Given the diversity of agricultural production in PNG, it will be essential to get sub-national governments involved in developing agricultural development strategies appropriate to their needs¹⁵.

¹⁵ Agricultural extension services are one of the functions devolved to provincial and local level governments under the 1995 Organic Law; for details see National Economic and Fiscal Commission (2009: 14). Other functions included funding elementary, primary and secondary schools and operating rural health services.

Improved agricultural support services, including better credit, are essential for faster agricultural growth, but by themselves will not have much effect if agricultural production is not profitable. If kina output prices are low relative to the cost of production, it is probable that more people will drift out of the rural sector and migrate to towns and cities in search of wage employment. This process will likely accelerate if the minerals boom produces a boom in urban development, including construction. The lesson from minerals booms in other parts of the world indicates that a process of 'de-agriculturisation' produces serious longer term economic and social problems which governments find very difficult to combat.

(2) Making better use of government and other resources in the educational sector:

That PNG faces a range of serious problems in delivering appropriate educational services to a fast-growing population under the age of 18 is clear. There appears to have been some growth in the proportion of children and young people in formal education since 1990, but the goal of universal basic education (UBE) is far from being met. This is in spite of the fact that the government, together with donor and community groups, is now spending close to eight per cent of GDP on education, a high percentage compared with many other Asian countries. The 2000 Census data also makes clear that there are very substantial differences between provinces in educational attainment which must reflect both provision of facilities and community attitudes towards the importance of education for all children.

The very considerable differences between provinces in educational attainment and literacy rates in PNG in 2000 indicate that a “one size fits all” strategy for educational development across the country is inappropriate. The special problems of the highlands provinces need to be addressed through policies appropriate to those provinces, while the provinces which have performed well (such as Manus, East New Britain and North Solomons) should be encouraged to move as quickly as possible towards UBE, making full use of community resources. At the central level, the necessary government resources must be made available to achieve UBE, even if this means taking resources away from other parts of the government.

(3) Ensuring greater non-government participation in post-secondary education and skills development:

The achievement of UBE should be made the over-riding priority of government over the next decade. But given current rates of population growth, numbers of young people coming from the primary into the secondary and post-secondary sectors will continue to grow. Many of those completing the primary cycle will wish to move on to secondary school, and many of those reaching years 10-12 will wish to move into some form of post-secondary education. Given the existing skills deficits in the country, it is essential that as many young people as possible are given the opportunity to fulfil their educational ambitions.

How can this best be done given budgetary constraints? The involvement of non-government agents in the provision of education in PNG is already considerable, and will

almost certainly increase in coming years. Churches play an important role in providing education at all levels in PNG, and have been the key actors in establishing two new universities in recent years. A Lutheran University is also due to commence teaching within the next few months¹⁶. In addition the active participation of other NGOs, and of private companies in expanding access to education should be encouraged. Many private companies, in the mining sector and elsewhere, have apprenticeship and training programs and these should be expanded, if necessary with tax incentives, especially where they cater for more than the immediate needs of the company. It is particularly urgent that private companies be encouraged to train high school graduates in technical and vocational skills as this is where labour market demand is likely to grow most rapidly over the next few years.

The provision of other types of skilled workers, including doctors, nurses and other health workers, teachers and lecturers, engineers, lawyers, economists, statisticians, psychologists and social workers will remain the responsibility of the university system. University graduates will also be needed to fill administrative positions in the central and provincial bureaucracies. From very small beginnings, the university system has expanded rapidly since independence, but for most of the past two decades has faced mounting financial problems. The depreciation of the kina has made PNG salaries unattractive to most academics from OECD countries, and has also adversely affected budgets for libraries, computers and laboratory equipment. While university systems in neighbouring countries such as Indonesia and the Philippines, face similar problems, their

¹⁶ It should be noted that most church institutions offering education and health services derive part of their funding from government and the donor community.

universities in recent years have been freed from central government control and given greater autonomy in seeking non-government sources of funding. This will have to happen in PNG as well.

(4) Planning and Coordination of Human Development Policies

It is difficult to escape the conclusion that human development issues in PNG have not received much attention from government over the last fifteen years. This reflects the trend towards increasing government instability over the 1990s, with frequent changes in administrations and ministers, which made any sort of medium or long-range economic planning difficult. Senior public servants with experience in human resource issues either retired or moved to more lucrative private sector employment. While there are several government departments and agencies with responsibility for education, training and skills development, their efforts appear to be poorly coordinated and under-resourced. In addition, there is a serious dearth of statistical data relating to education, and skills development. This report has relied heavily on the 2000 Census data which is now nine years old, but there are few more recent data which can be used to examine national trends¹⁷.

The National Strategic Plan, which will set targets for the nation for a forty year period (2010 to 2050), features human development and people empowerment as one of its six focus areas. But if the plan is to be more than a 'wish list' of desirable economic and social outcomes, the focus areas will have to be backed up with concrete and feasible

¹⁷ It is also striking that few attempts have been made to analyse what data do exist, or to use the data (from the 2000 census for example) to inform policy debates.

policy goals, embracing not just education and skills development, but also health and population policies. Attached to each goal should be a clear analysis of cost and the necessary budgetary support. The probable failure of PNG to reach most of the Millennium Development Goals by 2015, in spite of enhanced government resources from taxation, royalties and foreign aid, indicates a failure on the part of successive governments since Independence to set expenditure priorities, and stick to them over the longer term.

Responsibility for education up to secondary level, as well as rural health care services and agricultural extension services, are now delegated to provincial and local level governments, so it is imperative that these levels of government be given sufficient revenues to deliver services. Grants must reflect the different costs of service provision, and should take into account each province's capacity to raise revenues. The new system of intergovernmental financing drawn up by the National Economic and Fiscal Commission is an extremely important first step towards achieving a more equitable and efficient system of finance, but such a system must be accompanied by stronger central audit procedures if the enhanced revenues are to achieve their stated goals of improved service delivery¹⁸.

Finally it needs to be emphasised that a national human development policy must include a coherent medium-term population, migration and urbanisation strategy. PNG's population is currently put at around 6.732 million people, and is projected to increase to

¹⁸ See National Economic and Fiscal Commission (2009) for more details.

9.265 million by 2025, although this estimate may turn out to be too low¹⁹. Inter-provincial migration was by 2000 already significant; the census found that ten per cent of households were living in a province other than that in which the household head was born (Allen, Bourke and Gibson 2005: 214). The 2000 census revealed a low urbanisation ratio, but this will probably increase, especially if wages continue to grow in urban areas. In addition migration from poorer, more isolated rural areas to more advanced rural areas and to peri-urban areas, already well underway by 2000, will continue. The population of the NCD could be close to one million by 2025, and might exceed this. Financing housing, education, health, water and other urban services for a population of this size will be a major challenge for the provincial government. In addition, government at both national and sub-national levels will have to provide more and better services for the growing populations in rural areas, a significant proportion of whom may be migrants from other provinces. This also will tax administrative capacities at the national, provincial and local levels.

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¹⁹ The projections are given in www.geohive.com. They are derived from UN and US government sources.

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TABLES

**Table 1: Per Capita GDP in Papua New Guinea
(2000 PPP dollars)**

Year	Population (‘000)	GDP (1)	GDP (2)
1965	1990	1154	1082
1970	2288	1364	1311
1975	2610	1376	1246
1980	2991	2079	2087
1985	3380	1994	2040
1990	3828	1832	1754
1995	4350	2353	1902
2000	4934	2193	2250
2005	5555	2127	2127

Note: GDP (1) refers to real per capita GDP in 2005 dollars calculated using a Laspeyres index. GDP (2) refers to real gross domestic income in 2005 dollars adjusted for terms of trade changes.

Source: Penn World Tables v. 6.3, August 2009
(http://pwt.econ.upenn.edu/php_site/pwt63)

Table 2: Growth in Gross National Expenditure (GNE), Per Capita Gross Domestic Product (GDP), and Private Consumption Expenditure (PCE), 1994-2009 (1998 prices)

Year	GNE	GDP	PCE
Population growth: 3% per annum:			
1994	1222	1786	530
2000	1288	1499	638
2003	1183	1460	543
2006	1253	1429	625
2009	n.a	1548	n,a
Population growth: 2.7% per annum:			
1994	1051	1536	456
2000	1288	1499	638
2003	1193	1473	548
2006	1276	1454	636
2009	n.a	1589	n.a

Note: GNE is the sum of private and government consumption expenditures, gross capital formation and changes in stocks. GDP is the sum of GNE plus exports of goods and services less imports of goods and services.

Source: 1994-2006: Bank of Papua New Guinea **Quarterly Economic Bulletin**, March 2009, Table 9.7 The GDP figures for 2009 refer to budget estimates.

Table 3: Contributions to GDP Growth: 2004-9

	2004	2005	2006	2007	2008	2009
Agriculture	1.7	0.9	0.3	1.4	1.8	1.4
Oil and Gas	-0.3	0.4	0.0	-0.2	-0.2	-0.2
Other Mining	0.3	0.2	-0.7	0.2	0.3	1.3
Manufacturing	0.2	0.7	0.4	0.5	0.5	0.4
Utilities	0.1	0.0	0.0	0.1	0.1	0.1
Construction	0.3	0.5	1.3	1.9	1.9	1.3
Trade	0.2	0.3	0.4	0.7	0.5	0.4
Transport	0.1	0.1	0.1	1.1	1.4	0.7
Financial services	-0.1	0.2	0.3	0.2	0.2	0.2
Other services	-0.3	0.2	0.3	0.5	0.4	0.4
Total GDP	2.7	3.6	2.6	6.5	7.2	6.2
Non-mining GDP	3.1	3.4	3.8	7.3	7.9	4.6

Note: 2004 data are preliminary actuals; 2005-7 are estimates; 2008 and 2009 are projections

Source: 2009 Budget Papers, Volume 1.

Table 4 Percentage of the Employed Labour Force by Sector and Relative Labour Productivities, 1990 and 2000

Sector	% Share of the Labour Force		Relative Labour Productivity	
	1990	2000	1990	2000
Agriculture	80.2	72.3	0.4	0.4
Mining	0.3	0.3	33.8	70.7
Manufacturing	1.2	1.1	8.4	7.7
Utilities	0.3	0.1	5.0	12.6
Construction	1.9	2.1	2.7	1.9
Services	16.1	24.0	2.3	1.2
Total	100.0	100.0	1.0	1.0

Sources: UNDP/ILO (1993), Table 2.7; National Statistical Office (2002), Table D.4

Table 5: Growth in Categories of the Labour Force, 1990-2000 (Per cent per annum)

Category	Male	Female	Total
Waged	-0.6	3.4	0.3
Self-employed	1.8	6.0	3.1
Cash farming	-10.7	-10.4	-10.5
All monetary activities	-4.8	-6.1	-5.3
Subsistence activities	8.4	11.3	9.8
All employed	2.5	5.1	3.7
Unemployed	-5.2	-9.9	-6.5
Total labour force	2.0	4.6	3.2

Note: To obtain better comparability, North Solomons data were removed from the 2000 figures.

Sources: Unpublished figures from the 1990 Census; National Statistical Office (2002), Table D1.

Table 6: Labour Force Participation Rates by Sector and Gender, 1990 and 2000

	Total		Males		Females	
	1990	2000	1990	2000	1990	2000
Urban	56.2	48.4	72.4	58.7	34.8	36.2
Rural	71.1	70.4	77.5	69.9	64.3	70.4
Total	68.8	67.5	76.7	68.4	60.1	66.7

Source: National Statistical Office (2003), p. 62

Table 7: Percentage Breakdown of Men in the Labour Force: 1990 and 2000

Category	1990	2000
Waged	19.0	14.6
Self-employed	5.9	5.8
Cash farming	34.3	9.3
All monetary activities	59.2	29.7
Subsistence activities	31.7	58.2
Unpaid family workers	n.a	7.8
Unemployed	9.1	4.3
TOTAL	100.0	100.0

Sources: Unpublished figures from the 1990 Census; National Statistical Office (2002), Table D1.

Table 8: Percentage Breakdown of Women in the Labour Force: 1990 and 2000

Category	1990	2000
Waged	5.9	5.2
Self-employed	3.0	3.4
Cash farming	45.3	9.7
All monetary activities	54.2	18.3
Subsistence activities	39.6	73.3
Unpaid family workers	n.a	7.1
Unemployed	5.9	1.3
TOTAL	100.0	100.0

Sources: Unpublished figures from the 1990 Census; National Statistical Office (2002), Table D1.

Table 9: Percentage of the Citizen Population over 10 Employed in Monetary

Activities

Year	Male	Female	Total
1966	29.1	7.0	18.4
1971	31.8	12.1	22.3
1980	40.0	29.3	34.9
1990	45.0	32.3	39.0
2000	19.6	11.8	15.8

Sources: UNDP/ILO (1993), Table 1.7; National Statistical Office (2002), Table D1.

Table 10: Unemployment by Sector and Gender: 1990 and 2000

(Unemployed as a percentage of the total labour force)

	Total		Males		Females	
	1990	2000	1990	2000	1990	2000
Urban	30.1	16.2	28.6	19.4	34.3	10.2
Rural	4.5	1.5	5.4	2.3	3.4	0.7
Total	7.7	2.8	9.1	4.3	5.9	1.3

Source: National Statistical Office (2003), p. 62

Table 11: Numbers of Unemployed by Sector and Gender, 2000 ('000)

Category	Total	Male	Total
Total	68.6	53.7	15.0
Urban	36.3	28.5	7.8
Rural	32.3	25.1	7.2
Urban (under 25)	18.3	13.5	4.9
Rural (under 25)	16.4	12.0	4.4
Total (under 25)	34.8	25.5	9.3

Source: National Statistical Office (2002), Table D2.

**Table 12: Numbers of Unemployed, Other and Not Stated by Sector and Gender,
2000 ('000)**

Category	Total	Male	Total
Total Unemployed	68.6	53.7	15.0
% under 25	50.7	47.5	62.1
Other	183.0	107.3	75.7
% under 25	50.6	51.7	49.0
Not stated	118.3	64.5	53.8
% under 25	73.9	75.6	71.8

Source: National Statistical Office (2002), Table D2.

**Table 13: Citizen Population enrolled in schools by age group: 1990 and 2000 as %
of total population in the age groups**

	1990	2000	% Growth in Enrolments 1990-2000*
Males and Females			
5-9	14.3	21.9	101.0
10-14	53.5	54.3	37.0
15-19	22.5	33.8	96.9
20-24	3.5	7.2	163.9
25-29	0.7	2.3	318.7
Males			
5-9	14.5	21.9	94.6
10-14	52.1	54.4	38.1
15-19	25.6	36.4	84.7
20-24	5.2	9.5	133.6
25-29	1.1	3.0	247.3
Females			
5-9	14.1	22.0	108.6
10-14	50.0	53.9	49.5
15-19	18.9	30.9	116.0
20-24	1.8	4.9	258.9
25-29	0.3	1.6	562.1

- North Solomons has been removed from the 2000 figures.

Sources: Unpublished data from the 1990 census; National Statistical Office (2002), Tables A1 and C1.

Table 14: Citizen Population aged 15 and Over No Longer in School by Educational Attainment, 2000

Qualification	Total	Male	Female	Urban
Protective	5799	4564	1235	1990
Vocational	12,369	10,219	2150	3603
Technical	11,258	10,011	1247	5618
Trade	5681	5557	124	2714
Business/secretarial	19,468	7430	12,038	11,915
Teachers	26,941	16,858	10,083	6853
Health	10,966	4314	6652	3961
College	11,508	9508	2000	6073
Univ. degree	11,657	9750	1907	7911
Other	11,510	9590	1920	4505
Not Stated	20,171	12,908	7263	5488
Total	147,328	100,709	46,619	60,631
Total 15 plus	2,796,344	1,412,736	1,383,608	358,330
% of total population	5.3	7.1	3.4	16.9
Numbers with some education but no post-secondary qualifications:				
	1,276,157	708,148	568,009	230,317
Of whom those with grade 10-12 education				
	188,768	120,423	68,345	69,658

Source: National Statistical Office (2002), Table C3; National Statistical Office (2002a).

Table 15: Provinces Ranked by Index of Human Development, 2000

Province	HDI Index	Index of Economic Potential	Difference In Rank*
NCD	0.700	0.651	0
East New Britain	0.554	0.333	0
Manus	0.552	0.251	+1
New Ireland	0.515	0.239	+1
North Solomons	0.507	0.186	+3
West New Britain	0.497	0.266	-3
Central	0.464	0.166	+4
Milne Bay	0.452	0.128	+8
Western	0.449	0.159	+4
Northern	0.436	0.140	+5
Morobe	0.426	0.227	-5
East Sepik	0.386	0.184	-3
Madang	0.384	0.173	-3
West H'lands	0.372	0.217	-7
East H'lands	0.364	0.164	-3
Gulf	0.353	0.143	-2
Simbu	0.352	0.118	0
South H'lands	0.307	0.087	+2
West Sepik	0.301	0.099	-1
Enga	0.296	0.099	-2
PNG	0.405	0.184	

* Difference between the HDI ranking and the ranking on economic potential alone.

Note: The Human development Index given here is different from the conventional one. In the absence of provincial GDP figures an index of economic potential is estimated instead. This is a weighted average of the percentage of the population over 15 with a qualification (0.3333 weights) and the percentage of the employed population engaged in monetary activities (0.66667 weights). The other two components of the HDI were the life expectancy component (life expectancy in the province minus 25 divided by 60) and the education component, which was a weighted average of the literacy rate in the province (0.66667 weight) and the percentage of the population over five who had ever attended school (0.33333 weight). The HDI was a simple average of these three components.

Source: Provincial tables from the 2000 Census; life expectancy data as estimated by M. Bakker.

2007 – 2009 Contributors to Institute of National Affairs

Agmark Pacific Ltd (now with NGIP)
Air Niugini
Airways Hotel & Apartments
Allens Arthur Robinson
AIG PNG
ANZ Banking Group
Bank of Papua New Guinea
Bank South Pacific Ltd
Barrick (PNG) Limited
Blake Dawson & Waldron
Bougainville Copper Limited
Brian Bell & Co. Pty Ltd
British American Tobacco
Business Council of PNG
Chemcare Pharmacies Limited
Coca Cola Amatil
Coffee Exporters Association
Coffee Industry Corporation
CRA Minerals (PNG) Pty Ltd
Credit Corporation (PNG) Ltd
Curtain Brothers
Data Nets
Deloitte Touche Tohmatsu
Digicel Pacific
East New Britain Provincial Government
Embassy of the People Republic of China
Express Freight Management Ltd
Finance Corporation
Gadens Lawyers
Galley Reach Holdings
Global Internet
Goodman Fielder International Ltd
GRM International
Haginia Builders Ltd
Hastings Deering (PNG) Ltd
Highlands Pacific Group
Institute of Business Studies
Investment Promotion Authority
Kambang Holdings
Kenmore Pty Ltd
Kina Finance Ltd
KKB
KK Kingston

KPMG Peat Marwick
Kramer Group
Lae Builders
Lihir Gold Ltd
Manufacturers Council of PNG
Marsh Limited
Missionary Aviation Fellowship
MMI Pacific Insurance
Monian Group
Nangamanga Ltd
Nasfund Limited
National Capital District Commission
Nautilus Minerals Resources
New Britain Palm Oil Ltd
New Guinea Islands Produce Ltd
New Zealand High Commission
Oil Search Limited
Ok Tedi Mining Ltd
Orica PNG Ltd
Origin Energy
Pacific Rim Plantations Ltd (now Cargill – CPT)
Paradise Foods Ltd
Peter Mildner Architects
PNG Waterboard
Port Moresby Stock Exchange
Price Waterhouse Coopers
QBE Insurance PNG Ltd
Ramu Agri-Industries Ltd
RD Tuna Cannery
Rio Tinto Mineral Ltd
Rural Industries Council
SP Brewery Ltd
Steamships Trading
Steel Industries
Teisaki Ltd
Telikom PNG
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