PAPUA NEW GUINEA

DRAFT CHAPTER FOR WORLD DEVELOPMENT REPORT COMPANION VOLUME ON

'JOBS'

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1 INTRODUCTION

Papua New Guinea (PNG) is as an example of a developing country of moderate size with a significant resource boom and very poor human development indicators, or a 'resource-rich' country with extreme levels of poverty (and a poverty denial syndrome). Hardly a week passes without someone writing a letter to the newspapers deploring the failure of the government to convert the country's mineral wealth into 'development' for the broad mass of the population. Having formerly been administered by Australia, PNG achieved self-government in 1973 and became an independent state in 1975. Throughout its history as an independent nation, it has been heavily dependent on the resource sector – here defined as a combination of the mining and petroleum sub-sectors – for both export earnings and government revenues. The recent resource boom has exaggerated this form of dependency.

The general problem addressed this volume is to determine the conditions under which 'good jobs' have been or can be created in different national contexts, where the quality of a job is defined and measured by its contribution to productivity, living standards and social cohesion – in other words to 'development'. This problem is framed by a recognition that jobs have a social value which is distinct from the income or utility that they provide to their individual occupants. The question of whether a job seems good to the person who holds it is therefore distinct from the question of whether it is good for the wider society and economy to which that person belongs. And if there are policy decisions that can lead to the creation of more good jobs in a national economy, these may entail some trade-offs between the three dimensions of social and economic development (World Bank 2012).

Although PNG is treated as a specific type of country for the purpose of the present volume, it also resembles some of the other countries discussed in other chapters. Aside from its possession of a dominant resource sector, it is still an agrarian country, like Mozambique, in the sense that formal

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employment barely accounts for more than 10 percent of total employment (World Bank 2012: 191). As we shall see, it is also a country with high youth unemployment, like Tunisia (ibid.: 206), and could even be regarded as conflict-affected country, like South Sudan, because of the rebellion that took place on the island of Bougainville and the widespread incidence of 'tribal fighting' in parts of the central highland region. It is therefore a moot point whether PNG's wealth of mineral resources is the characteristic that best explains its current job configuration, and whether it most resembles other resource-rich yet still poor countries in the configuration of its development choices (ibid.: 199).

In the case of PNG, the conventional wisdom says that the resource sector is not the place where one would expect to find jobs that are good for development, let alone to create more of them. First, it is thought to supply very little in the way of employment opportunities for Papua New Guineans when compared with other sectors of the national economy – especially the agricultural sector. Second, it is thought to consist of a set of economic enclaves that do not produce more business or more jobs in the rest of the national economy by means of backward or forward linkages. Third, a large and booming resource sector may even destroy jobs in the rest of the national economy by inflating the value of the national currency and raising the costs of doing business in other sectors – an affliction known as the Dutch Disease. For these reasons, the sector has long been seen as a sort of cash cow whose role is to supply the national government with the revenues it needs to achieve 'development' by means of public spending. From this point of view, the best jobs in the national economy would be those occupied by politicians and public servants who manage these mineral revenues for the benefit of the nation as a whole. The only good jobs in the resource sector itself would be those held by a few company managers who have worked out a way to create business and job opportunities in mine-affected areas that are not dependent on contracts with their own companies.

In this chapter, we aim to challenge this conventional wisdom in several ways. We argue that the number of jobs created by the resource sector, directly and indirectly, is much larger than is commonly assumed. We question the idea that the resource sector is any more isolated from the rest of the national economy than some of the other export industries which employ large numbers of Papua New Guineans, like the logging industry, the oil palm industry or the fishing industry. We concede that the Dutch Disease has been a real problem in periods when the resource sector has been booming, but the mismanagement and misappropriation of the government's mineral revenues has been an even bigger problem, even when the sector has been stagnant. We do not equate the social value of jobs with the social value of the economic sector in which they are located, but propose that jobs in the resource sector may have good qualities that are shared with jobs in other sectors. And instead of thinking of workers themselves as being locked up for life in one economic sector, we aim to focus on the social value of the career paths that take workers from one sector to another or one location to another.

The main problem we faced when embarking on this study was that PNG boasts very little in the way of statistical evidence that would enable us to compare social value of jobs in different parts of the national economy, or even to compare the levels of productivity, living standards or social cohesion between different sections of the national population. Given the limited resources available for the collection of new data, we therefore decided to interview a group of workers who were currently or formerly employed in the resource sector in order to assess the social values of their jobs and their careers. In reporting the findings of this survey, we shall focus attention on what the World

Development Report describes as 'positive spillovers' (World Bank 2012: 15). For example, we consider the value of the remittances which workers provide to households other than their own and the additional job opportunities created by those who have taken new jobs overseas. But what is more difficult to assess, and still needs to be considered, is the role of jobs and workers in the resource sector in the formation of a proactive urban middle class which has the interest and capacity to influence the behaviour of PNG's elected politicians. Given that the major resource companies operating in PNG have taken on many of the functions of government, often against their will, important questions arise about the role of their senior national employees in making decisions about national development from which the conventional wisdom would exclude them.

2 PLENTY IN THE MIDST OF POVERTY

Given that PNG's inclusion in this volume is a function of its status as a nation rich in mineral resources but very poor in its human development indicators, we first need to establish the extent of its mineral wealth and its human poverty. Mineral wealth is here understood to be wealth created from the extraction of sub-surface mineral resources, which are here taken to include oil and gas resources. To understand the apparent paradox in the failure of mineral wealth creation to alleviate the poverty of many, if not most, Papua New Guineans, we shall not simply invoke the well-worn concept of the 'resource curse', but rather consider the relationship between the country's resource development policies and its poverty alleviation or broader national development policies. Although there is evidence of a link between PNG's economic dependency on the resource sector and the incidence of social conflict and political corruption (Banks 2005; Koyama 2005; Filer and Macintyre 2006), that is not the main focus of our present study. Social conflict and political corruption are simply treated as possible obstacles to the creation of more good jobs in a resource-dependent economy. We do not seek to establish a causal relationship between these obstacles and this form of dependency.

2.1 A Resource-Rich Country…

If a resource-dependent economy is defined as one in which extractive industry contributes more than 50 percent of export earnings and more than 15 percent of GDP, then PNG has had a resource-dependent economy for most of the period since 1975 and all of the period since 1985. Even at the time of Independence, when the Panguna copper mine was the only large-scale mining operation in the country, mineral exports accounted for 60 percent of the value of all PNG's exports. Since 1984, when the Ok Tedi mine came into operation, the proportion has rarely fallen below 60 percent, even after the Panguna mine was forcibly closed in 1989. Since 2002, the proportion has been fluctuating around 78 percent (Table 1). Over the same period, the production of these mineral exports has normally accounted for something between 20 and 30 percent of the country's GDP (Table 2).

Table 1: Percentage of PNG export values by sector, 2002-2012.

SECTOR	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Resources	75.0	75.3	75.6	80.3	84.2	82.3	79.0	78.8	79.5	73.5	78.2
Agriculture	15.1	13.8	13.1	11.9	8.5	10.9	13.9	13.7	13.4	18.5	15.6
Forestry	6.5	5.3	5.6	4.7	4.1	4.5	3.4	3.9	4.8	4.7	4.5
Other	3.4	5.6	5.7	3.1	3.2	2.3	3.7	3.6	2.3	3.3	1.7

Source: Bank of Papua New Guinea.

Table 2: Percentage sectoral composition of PNG's gross domestic product, 2002-2011.

SECTOR	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Primary industry	38.6	37.4	34.9	34.0	32.1	32.2	32.8	33.1	31.5	31.1
Extractive industry	20.6	22.7	24.5	27.5	30.4	29.7	27.9	21.6	23.0	18.5
Manufacturing	6.3	6.4	6.5	6.3	5.9	5.8	5.9	6.1	5.8	6.8
Power & water	1.7	1.8	2.0	2.0	2.0	2.0	1.9	2.1	2.1	2.2
Construction	8.7	8.8	9.0	8.4	8.7	9.5	10.5	13.4	14.1	16.5
Wholesale & retail trade	6.5	6.6	6.8	6.4	6.3	6.4	6.6	7.4	7.6	8.5
Transport & communications	2.3	2.3	2.3	2.1	2.0	2.0	2.1	2.8	3.0	3.3
Financial services	3.5	3.3	3.2	3.3	3.5	3.5	3.6	4.3	4.2	4.5
Community & social services	11.8	10.9	10.7	9.8	8.9	8.9	8.6	9.2	8.6	8.6

Source: Asian Development Bank.

Insofar as PNG has experienced a resource boom in recent years, it has not been a boom in production, but a boom in exploration and construction. Although there was a steep rise in the world market prices of oil, copper and gold between 2002 and 2012, the volumes of these commodities exported from PNG did not follow suite. The volume of crude oil exports fell from more than 150,000 barrels in 2002 to less than 6,000 barrels in 2012. The volume of copper exports was 44 percent lower in 2012 than it had been in 2002, while the volume of gold exports was 42 percent lower. Two gold mines were opened during this period, but their exports did little more than replace those from another gold mine that closed in 2004. Recent spikes in net foreign direct investment are almost entirely due to spending on resource project construction. The huge spike that began in 2009 reflects the capital cost of the PNG LNG Project, currently estimated at 19 billion US dollars (more than twice the total value of PNG's annual exports), but only 5 percent of this investment will have entered the national economy when the construction phase ends in 2014. Annual growth in GDP has been running at an average of 7 percent since 2007, but most of this growth is attributed to the construction and agriculture sectors, not to the resource sector.

The World Bank considers that the rate of economic growth may well have peaked in 2012, because the prices of PNG's main exports are now weakening while the national currency has barely begun to depreciate (Bulman 2013). The PNG kina was trading at close to 50 US cents during the course of 2012, which meant that it was stronger than it had been since the collapse of commodity prices in the wake of the Asian financial crisis in the late 1990s. There was a notable decline in the value of exports across all sectors between 2011 and 2012. The weighted average price of PNG's export commodities fell by 14 percent over this period. The total value of exports from the resource sector fell by 17 percent, those from the forestry sector by 26 percent, and those from the agricultural sector by 34 percent.

Once operational, the LNG Project should increase the total value of PNG's exports by two thirds or more, and as operations proceed, it should raise total government revenues by as much as one third of their current value. The impact of project construction on GDP has been relatively small because most of the construction activity takes place offshore and national employment accounts for only 10 percent of total labour costs. However, the steady increase of government revenues after the first few years of what is expected to be an operational phase of at least 30 years could boost GDP by 25 percent or more when the volume of gas exports reaches its peak. The PNG Department of Treasury has estimated that the project will make a net addition of 15-20 percent to GDP, and a 10 percent addition to GNI, over its entire life.

Such predictions tend to assume that all other things are equal, but this is unlikely to be the case. There is much uncertainty about the value of future contributions to export earnings, GDP, GNI and government revenues from other sources, both within and beyond the resource sector. On the other hand, there is a risk that the national government will raise levels of spending and borrowing in anticipation of tax revenues from new resource projects that will not begin to turn a profit until several years after they have started to operate, even if they have not been granted a tax holiday in their development contracts (Batten 2013; Bulman 2013). At the end of an earlier exploration boom in the 1980s, the country's GDP grew by more than half over a four-year period in which two major resource projects became operational, but a large part of that growth was due to government spending and borrowing based on the anticipation of future tax revenues, and that episode ended in a fiscal crisis from which the government had to be rescued by a structural adjustment loan from the World Bank (Chand and Stewart 1997).

Although a second exploration boom has been in evidence in the period since 2002, the major resource projects that have so far been developed during this period have been based on discoveries made during the earlier boom. These include the Ramu nickel-cobalt mine, which was commissioned at the end of 2012, as well as the PNG LNG Project. The interval between the discovery of a significant resource and the grant of a development licence by the national government is typically more than 10 years. Delays are partly due to the volatility of commodity prices and partly due to the complexity of the development approval process. There are strong expectations in some quarters that one or two more LNG projects will prove to be feasible and will be granted development licences within the next two or three years, and that one or two large-scale copper mines will follow suit. If these expectations are realized, then PNG's economy will be more resource-dependent than ever before, despite the rapid decline in output from major resource projects already in operation. If they are not realized, there will simply be a shift in the overall composition of outputs and benefit streams derived from the resource sector.

2.2 … But Still a Poor Country

In 2012, PNG ranked 153rd out of 179 countries listed in the United Nations Human Development Index, which makes it the lowest-ranked country in the Pacific Islands region, and the third lowest in the Asia-Pacific region as a whole after Afghanistan and Nepal. In 2002, the country's per capita GDP was just under K2200, and remained at this level (in real terms) until 2007 (ADB 2012). Since then it has grown

by roughly 25 percent, mainly as a result of the resource boom, but most people are no better off than they were before.

Preliminary data from the 2011 national census indicate that PNG has a population of just over 7 million. In 2000 – the last year for which detailed national census data is currently available – about four fifths of the population (then less than 5 million) still lived in traditional rural village communities, while the rest was distributed between large and small urban centres, peri-urban settlements and 'rural non-villages' such as oil palm estates and resettlement schemes. Half of the total population was living in the densely settled valleys of the central highlands, while another third was living within 10 kilometres of the coastline. The most recent census data suggest that there has not been much change in this geographical distribution since 2000. Indeed, they seem to suggest that the urban population may actually have fallen as a proportion of the total population – from 13.2 to 11.2 percent. However, this trend has most likely been offset by an increase in the proportion of people living in peri-urban or roadside settlements that are technically located outside of existing town boundaries.

Evidence from various sources suggests that the rural village population can be divided between three zones of relative prosperity or poverty:

- About 40 percent inhabit an inner zone where there is reasonably good access to markets or urban centres, and villagers can therefore derive a reasonable income from the sale of cash crops or other commodities.
- Another 40 percent inhabit an intermediate zone, where income earning opportunities are much more limited, but where schooling has enabled some people to get paid employment and hence to provide some support to their home villages by means of remittances.
- The final 20 percent inhabit an outer zone where contact with both the market economy and the formal education system has been very limited, and there are barely any social or economic links between village and town.

According to standard definitions of the poverty line in developing countries, 35-40 percent of the total national population fell below that line when a nationwide sample household survey was conducted in 1996 (Gibson 2000; World Bank 2004). About 5 percent of the poor people in PNG then lived in urban and peri-urban squatter settlements, but the vast majority were to be found in the intermediate and outer rural zones. Poverty levels were especially acute in the lowland interior and highland fringe areas that accounted for most of PNG's total land area but only one sixth of its total population.

There is some popular resistance to the very idea of poverty in PNG. This is due to an assumption that all native Papua New Guineans are customary landowners and therefore have a right to a life of 'subsistence affluence' in the rural village communities to which they already belong or to which they could easily return (ADB 2002). In practice, it is not clear how many of the people who do not live in rural village communities could actually exercise this right of return, but more importantly, it is not clear how many would even wish to do so, given the conditions in which most rural people actually live. Assessments of rural poverty in PNG have not been solely based on cash incomes, but have also taken account of the economic value of subsistence production and a range of human development indicators that measure the overall welfare of the rural population (Cammack 2008). For example, in the

intermediate and outer rural zones, life expectancy at birth typically varies between 30 and 50, while the infant mortality rate typically varies between 10 and 40 percent (Bakker 1986; Bauze et al. 2012).

The geographical distribution of poverty has not changed much since Independence in 1975. This is essentially because the worst social indicators are associated with environmental conditions in which the practice of subsistence agriculture is least productive (Hanson et al. 2001). There has been a steady flow of migrants from less advantaged to more advantaged areas, but the flow has been limited by the unwillingness of many customary landowners to accommodate migrants on their land, while migrants who squat on the relatively small areas of vacant state land in urban areas are often threatened with eviction. The ability of the poorest villagers in the intermediate and outer rural zones to move beyond the confines of their own customary land is constrained by the absence of close relatives who have already secured their own livelihoods in better locations. At the same time, the spatial extent of the intermediate and outer rural zones seems to have grown as the quality of economic and social infrastructure in rural areas has declined, so many rural village communities now have less access to decent schools or health facilities than they had in 1975 (Gibson et al. 2006).

All this helps to explain why most rural villagers welcome the prospect of a major resource project because they think it represents their best chance of 'development.' The development of a few major resource projects in some rural locations has modified the geographical distribution of relative prosperity and poverty, but not to the extent that might have been anticipated (Baxter 2001; World Bank 2004). A substantial proportion of the benefit streams that ought to flow to the original residents of areas directly affected by the development of these projects have been captured by local elites, or by relatives living in town, or by new migrants to the affected area, or by politicians and public servants who have no local ties at all. As a result, many of the people living in the affected areas show little or no improvement in their standard of living, even after a project has been operating for 10 or 20 years. And when a major resource project closes down, the only significant change in the situation of such people might be the increase in the number of their relatives who have managed to escape from what then ceases to be a directly affected area and reverts to simply being a more or less impoverished area.

The only recent change in the spatial incidence of poverty that has been documented in the literature is an apparent increase in the number of poor people living in the national capital, which now accounts for roughly 40 percent of the total urban population. Evidence from a recent household survey suggests that the proportion of this segment of the urban population living below the poverty line has increased from 30 percent in 1996 to 44 percent in 2010 (Gibson 2013: 22). If urban and rural poverty rates are now in greater alignment with each other, this could help to explain why rates of urbanization have been relatively low. Although nominal earnings from both formal and informal sector employment have risen more rapidly in the national capital than in other urban areas, real earnings seem to have fallen because of an increase in the cost of living which could be 70 percent or more since 2002 (Bulman 2012). If this increase is itself a symptom of the Dutch Disease, then the resource boom has so far done nothing to alleviate the incidence of urban poverty.

2.3 Resource Development Policies

The development of major resource projects in PNG is framed by three main types of agreement that are normally negotiated in the following order:

1. Compensation agreements between the holder of an exploration licence and the customary owners of the land covered by that licence provide for payments to be made for damage caused to any assets or resources which belong to the customary landowners or landholders. These agreements are subject to some degree of government regulation, and are likely to be revised and expanded if exploration leads to a development proposal.
2. Development agreements between the national government and prospective investors are based on feasibility studies which the investors provide to the government, and are primarily concerned with the distribution of economic costs and benefits between the two parties. These agreements are also conditional on a prior process of environmental and social impact assessment.
3. Benefit-sharing agreements between the national government, the provincial and local government(s) hosting the project, and the customary owners of the land required for development purposes, are negotiated through an institution known as the development forum (Filer 2008). The developers are not formally involved in the negotiation of these agreements, but development licences are not granted until the agreements have been finalized.

The first two types of agreement have been features of the mineral policy framework since Independence in 1975; the third type was added in 1988 in response to political pressure from provincial governments and local community representatives (Filer and Imbun 2009).

Compensation agreements normally make no reference to project employment or other forms of national and local participation in project development. Development agreements have normally required that national participation or 'national content' be specified in training and localization plans and business development plans whose implementation is then reported to the national government at regular intervals. These plans are subject to the 'preferred area policy' which has come to inform the negotiation of benefit-sharing agreements.

The origins of the preferred area policy can be traced back to a pair of decisions made by the newly independent national government in 1976:

- The first decision was to repatriate a sum equivalent to the whole of the royalty collected by the national government in its capacity as the legal owner of sub-surface mineral resources to the province from which those resources were extracted. This decision was made in response to threats of secession from the province that hosted the Panguna copper mine, but it would have general application under the new system of provincial government that was put in place at the same time.
- The second decision was to oblige the future developer of the Ok Tedi gold and copper mine to give preference in training, employment and business development to the people of the area most directly affected by the mining operation. This decision was not initially meant to have general application, nor did it apply to the Panguna mine. It was justified by the observation

that the people living around the Ok Tedi mine were exceptionally poor and therefore deserved this form of affirmative action.

Considerations of poverty and equity have long since disappeared from the preferred area policy. The allocation of royalties and the allocation of entitlements to training, employment and business development opportunities are now included in the range of benefits that are subject to benefit-sharing agreements through the institution of the development forum. The policy has thus created concentric rings of entitlement around each major resource project, with the innermost ring occupied by the customary owners of the land covered by development licences, the next by 'project area people' (however these might be defined), the next by the people or government of the host province, and the outermost ring by the population or government of the nation as a whole (Filer 2005). These zones cut across the geographical zones of relative prosperity or poverty described in the previous section.

In the period since the development forum was invented, there has been a steady increase in the proportion of the direct economic benefits from each new resource project that is captured by organizations or individuals in the three inner circles of entitlement. In 1988, less than 5 percent of the money which the national government collected from the operation of the Panguna mine went back to the host province (Filer 1997). By 2002, with four large-scale mines in four different provinces producing revenues for the national government, the proportion had risen to more than 25 percent (Finlayson 2002). It is not so easy to calculate the distribution of wages and other benefits between different sections of the national workforce employed on major resource projects, or the value of contracts for nationally owned companies to supply goods and services to these projects, but the available evidence indicates that the preferred area policy has also served to increase the proportion captured by workers and companies within the host provinces and more limited areas of preference. Since 1993, the economic privilege bestowed on preferred areas has been compounded by a tax credit scheme which enables developers to supply social and economic infrastructure to local communities and count the cost as income tax already paid to the national government (Filer 2008).

The share of resource project benefits captured by different sections of the national population does not remain constant through the life of each major project. The national government has been inclined to postpone the revenue share which it collects on behalf of the country as a whole while providing more in the way of up-front payments to provincial and local stakeholders in order to secure their political support for the construction and initial operation of each new project. This temporal imbalance grows more acute with the scale of the project. The national government has already promised to deliver K1.2 billion in infrastructure development grants to the provinces hosting the LNG Project during the construction phase and the initial phase of operations. Another K120 million has been promised as 'seed capital' for local landowner companies to take advantage of new business opportunities during the construction phase. These are more than 100 times the amounts promised under the benefit-sharing agreement for the Lihir gold mine that was finalized in 1995, and was regarded at the time as an unprecedented act of generosity on the part of the national government. When the LNG Project begins to export gas in 2014, 4 percent of the value of production – around K400 million a year – will instantly accrue to the host provincial governments, local-level governments, and assorted landowner groups in the form of royalties and development levies. Meanwhile, the national government will have borrowed money overseas to finance the implementation of its initial promises and to purchase a 20 percent

equity stake in the project, part of which will also be held in trust for provincial and local stakeholders. By the time that the national government begins to earn significant revenues from corporate income tax on the profits of the operation, a large part of these revenues will most likely be used to pay off the debts.

The Constitution of PNG calls for non-renewable resources to be used wisely for the purpose of national development and the benefit of future generations. At the time of Independence, policy makers accepted the orthodox argument that large-scale resource projects would not serve this purpose by creating new jobs or new business opportunities, but could serve this purpose by providing additional revenues to the national government. However, the nation's mineral wealth has not been successfully applied to the creation of a more diversified national economy, nor has it been used to improve the health and education of the national population as a whole, nor has it served to remove the country's dependence on foreign aid. Instead, the perceived failure of the national government to make wise use its mineral revenues has stimulated the demand for these revenues to be redistributed under the preferred area policy. The implementation of this policy has created many new opportunities for mineral revenues to be misappropriated as they flow back from the national government to the host provinces. And even if benefits were properly distributed in accordance with the terms specified in benefit-sharing agreements, there would still be a greater problem of resource dependency at the provincial and local level than already exists at the national level. The more that local organizations and individuals come to depend on a single resource project for their incomes and general welfare, the more they are likely to lose when that project comes to the end of its life (Filer and Imbun 2009). The purchase of provincial and local political support for major resource projects by means of benefit-sharing agreements appears to be a necessary condition for their development, but it has also created intractable problems of governance and sustainability.

2.4 Poverty Alleviation Policies

It is hard to disentangle the national government's poverty alleviation policies from its broader national or rural development policies because of the poverty denial syndrome. National policy makers tend to associate the concept of poverty alleviation with the country's continued reliance on foreign aid, which still accounted for 10 percent of total government revenues in 2012. At the time of Independence in 1975, they were inclined to compare PNG with Kenya or Tanzania when considering their choice of an appropriate development path; now they tend to compare PNG with Malaysia and Botswana when lamenting the fact that their country has not developed as rapidly as it should have done, given its wealth of natural resources (GPNG 2010a: 6).

During the first ten years of independence, the national government directed a disproportionate share of its development budget to the poorest rural districts through what was known as the 'less developed areas policy.' It was this policy that led to the designation of the area around the Ok Tedi mine as an area deserving of special preference in the distribution of mine-related benefits. In other parts of the country, where there was no immediate prospect of a major resource project, the policy was supported by foreign aid agencies in the funding of 'integrated rural development projects.' However, the results were generally disappointing (Crittenden and Lea 1989). The policy was largely abandoned in 1986 when the government adopted a medium-term (5-year) development planning framework in which the

development budget was directed to sectoral rather than regional priorities. In recent years, this approach has been supplemented by the adoption of a long-term (20-year) national development plan (GPNG 2010a) and an even longer term (40-year) national vision statement (GPNG 2009). These in turn have been supported by the adoption of new development plans for what are seen as key sectors of the national economy – most notably an agriculture development plan (GPNG 2007a) and a land mobilization program (GPNG 2010b).

The national vision statement says that PNG could be ranked amongst the top 50 countries in the United Nations Human Development Index by 2050 if its people undergo a sort of mental revolution:

> The future development focus under Vision 2050 will shift from a poverty reduction mentality to a positive wealth creation mind-set. It is the intention of Vision 2050 to turn struggling rural Papua New Guinean communities into economic growth centres through the mobilization of the masses. It is essential that a rigorous program in entrepreneurial skills development is established, and that communities are arranged into cooperative societies or nucleus estates for collective economic growth (GPNG 2009: 51).

The shift from a 'scarcity mentality' to an 'abundance mentality' is explicitly linked to a program of land reform that will make it possible to establish new forms of economic enterprise on the customary land that is generally thought to account for 97 percent of PNG's total land area. In this way, a nation of customary landowners competing (or just hoping) to get a share of the rent generated by major resource projects can be turned into a nation in which half of the (working-age?) population will be 'self-employed entrepreneurs' (ibid.: 7). The vision statement does not say where the 'economic growth centres' should be established, but assumes that all districts should be treated equally when it says that one or two 'impact projects' should be implemented in each of them (ibid.: 4). This view is consistent with existing government policy, which currently divides 35 percent of the development budget equally between all members of parliament to spend as they see fit on the development of their own electorates, regardless of whether they host a major resource project or have an unusually large population or suffer from extreme levels of poverty.

The long-term national development plan has a somewhat different vision of what it calls 'economic corridors.' It proposes that 50 percent of the development budget will be divided between ten of these entities and they 'will be located in the poorest regions of PNG with the aim of extending the benefits of development to the most disadvantaged regions' (GPNG 2010a: 18-19). All but one of them cuts across provincial boundaries and each one is to be administered by an Economic Corridor Implementation Authority operating outside of the provincial government system, with relative financial autonomy and a focus on large-scale investment in economic infrastructure. This may sound like a new lease of life for the less developed areas policy, but to judge by the map showing the boundaries of the ten corridors (ibid.: 21), the rural village population within them would be divided between the three zones of relative prosperity or poverty in much the same proportions as the rural village population beyond them. Furthermore, the first such entity to be approved by the National Executive Council (in 2009) was the Petroleum Resource Area Economic Corridor, whose boundaries overlap those of the preferred area for the LNG Project. In this instance, it is not clear whether the aim of the relevant Implementation Authority would be to facilitate communications between the preferred area and the rest of the country or to provide a form of insurance against the mismanagement of gas project revenues by provincial and local-level governments.

3 UNDERSTANDING THE JOBS CHALLENGE

We shall now consider the ways in which PNG's job configuration has evolved since Independence, the ways in which the recent 'resource boom' has altered this configuration, and the ways in which the PNG government currently treats the problem of job creation (or unemployment). Although there is a long history of national debate about the effects of different forms of minimum wage determination on the number of jobs in the urban and rural sectors of the national economy (Levantis 2000; Imbun 2009), we do not propose to revisit this debate because the current (2008) determination, which sets a minimum wage of K200 per fortnight in both sectors, is no longer a topic of much debate between policy makers and employers. A more pertinent observation would be that the evidence on which any type of employment policy might be based is now smaller than it was in the first ten years of Independence. Although we might revisit the earlier evidence base, its current relevance is questionable. And since we know so little about the productivity of labour in different parts of the national economy, or the wages and other benefits secured by workers in different private sector occupations – especially in rural areas – it is all but impossible to make a quantitative assessment of trade-offs between the contributions that different types of jobs make to productivity, living standards and social cohesion.

3.1 Changing Patterns of Employment

Given the dearth of statistical information about the operation of the labour market in PNG, it is quite hard to establish historical trends in the numbers of people employed in different parts of the national economy. In the 1980 national census, wage-earners accounted for just over 10 percent of the total population, and just under 10 percent of the citizen population, aged 10 and over. At that time, there were almost 16,000 expatriates in the wage-earning population, of whom 74 percent were men, and just over 200,000 citizens, of whom 87 percent were men. If we confine our attention to the citizen population aged 15 and over – which approximates the current definition of the working-age population – it appears that 12 percent of them had jobs in the formal sector and 60 percent had jobs in the informal sector (Table 3).

Table 3: Economic activities of citizens aged 15 years and over in 1980.

ACTIVITY	NUMBER	%
Formally employed	198,029	11.7
Informally employed	1,012,967	59.8
Not in labour force	275,879	16.3
Apparently unemployed	201,941	11.9
Not stated	5,709	0.3
TOTAL	1,694,525	100.0

Source: GPNG 1988, Tables IV.1 & IV.6.

Published data from the national census conducted in 1990 and in 2000, and from the one most recently conducted in 2011, does not allow for this type of breakdown, and cannot be used to establish trends in the numbers of men and women holding jobs in the formal and informal sectors, or in urban and rural areas, over the period since 1980. In 2002, it was estimated that there were roughly 187,000 people

formally employed in PNG's urban centres, which was somewhere between 5 and 6 percent of the working age population at the time (Booth et al. 2006). There is no comparable estimate of formal sector employment in rural areas at that time. Wages accounted for 19 percent of GDP in 2002, but this proportion had fallen to 13 percent by 2006, and may have shrunk even further since then (ADB 2012).

The most recent evidence on the nationwide distribution of jobs in PNG comes from the Household Income and Expenditure Survey (HIES) undertaken by the National Statistical Office in 2009 and 2010. This survey included a 'personal schedule' of questions addressed to more than 12,000 individuals aged 15 years and over in a stratified sample of more than 4000 urban and rural households (Gibson 2013: 6). Several of the questions in the personal schedule were concerned with jobs and incomes. The published survey results contain a puzzle that has yet to be resolved. About 62 percent of the individual respondents were found to have jobs of one sort or another – 45 percent in urban households and 65 percent in rural households (GPNG 2012a: 96). About 59 percent of these job-holders were found to be formally employed wage-earners – 79 percent in urban areas and 50 percent in rural areas (ibid.: 100). Given the assumption in the survey design that 14 percent of the total national population was living in urban areas, the implication would be that there were just over 200,000 wage-earners in urban areas and almost 1.2 million in rural areas in 2010. The idea that wage-earners account for roughly one third of the working-age population in rural areas can only be based on a miscalculation. According to one source familiar with the survey data, the proportion is more like 7 percent (John Gibson, personal communication, June 2013). In that case, the number of formally employed wage-earners in rural areas would have been less than 250,000, and many of these people would not have been employed throughout the year. The adjusted total of roughly 450,000 full-time or part-time wage-earners in 2010 is consistent with the Bank of PNG's estimate that total formal sector employment grew by 63 percent between 2002 and 2012.

In the absence of additional information, it is not possible to give further credence to the published HIES data on the distribution of jobs between rural workers. In the national capital and other urban areas, some additional work has been done to compare the latest HIES data with data from the Urban Household Survey conducted in 1986, which is the only previous nationwide sample survey that contains comparable data (Gibson 2013: 1). Over a 25-year period, there had been a significant increase in the proportion of women, and a corresponding decline in the proportion of men, formally employed in urban areas, although men still outnumbered women by a ratio of 2 to 1 (see Tables 4 and 5). Both men and women were now more likely to have jobs in the informal sector, and 80 percent of them were engaged in petty trading activities of one kind or another, but women still outnumbered men in this sector by a ratio of 2 to 1 in the national capital and 3 to 1 in other urban areas. There was no evidence of a reduction in the high rates of youth unemployment discovered in the earlier survey. More than two thirds of urban respondents aged 15-24 (excluding students) were either looking for work or were not in the labour force (ibid.: 10).

Table 4: Change in participation of working-age men and women (excluding students) in different economic activities in the national capital between 1986 and 2010.

ECONOMIC ACTIVITY	1986 % M	1986 % F	2010 % M	2010 % F
Wage employment	56.4	19.8	48.1	24.9
Household business	2.4	0.4	2.3	2.4
Informal sector	4.6	14.0	10.2	22.9
Looking for work	7.7	2.7	8.1	4.9
Not in labour force	32.2	64.0	37.6	49.5

Table 5: Change in participation of working-age men and women (excluding students) in different economic activities in other urban areas between 1986 and 2010.

ECONOMIC ACTIVITY	1986 % M	1986 % F	2010 % M	2010 % F
Wage employment	61.9	18.2	45.5	22.7
Household business	8.1	3.8	4.6	2.9
Informal sector	9.4	27.7	11.7	32.7
Looking for work	8.5	1.6	5.8	4.2
Not in labour force	21.4	51.6	37.8	43.5

Source for both tables: Gibson 2013, Tables 1 and 3.

If we are correct in estimating a formal sector workforce of approximately 450,000 in 2010, what proportion of these workers would have been working in the resource sector? The PNG Chamber of Mines and Petroleum seeks employment data from its member companies at regular intervals, but the response rate has been far from satisfactory. At the end of 2010, the Chamber estimated that the number of people formally employed in the work of exploration, construction and extraction had grown from 12,000 in 2004 to 30,000 in 2010. These numbers included expatriates as well as Papua New Guineans, and people employed by on-site contracting companies as well as those directly employed by mining and petroleum companies. Survey responses from 2010 show the pattern of employment in the three largest and oldest mining operations in PNG (Table 6). Here it can be seen that the proportion of expatriates in the workforce tends to decline with the age of the operation, the proportion of women is roughly constant at around 10 percent, and the proportion of national workers drawn from the host province or 'preferred area' varies according to the size of the population in the area of preference.

It is not clear how many of the estimated 30,000 workers in 2010 were thought to be part of the LNG Project construction workforce, given that construction started in that year. The number of people employed in construction of the LNG Project reached a peak of around 19,000 in the second half of 2012, but only half of them were Papua New Guineans, and the number of jobs available for national workers will fall to around 800 when the construction phase ends in 2014. The number employed in construction of the Hidden Valley gold mine reached a peak of around 3000 in 2008, and the number employed in construction of the Ramu nickel-cobalt mine reached a peak of around 5000 in 2011. Both

of these large-scale mines have since started operating with roughly one third of their peak construction workforce.

Table 6: Formal employment reported by three largest hard-rock mining projects in PNG in 2010.

CATEGORY	OK TEDI	PORGERA	LIHIR	ALL
National employees (total)	2,046	2,418	1,957	6,421
Preferred area employees	*712*	*1,666*		
Host province employees	*57*	*36*	*814*	
Other employees	*1,264*	*716*	*1,143*	
Non-citizen employees	116	178	224	518
All male employees	*1,945*	*2,210*	*1,888*	
All female employees	*217*	*208*	*293*	
TOTAL DIRECT EMPLOYMENT	2,162	2,596	2,181	6,939
Contractors' national employees	*2,628*	*846*		
Contractors' non-citizen employees	*434*	*39*		
TOTAL INDIRECT EMPLOYMENT	3,062	884	2,842	6,788
TOTAL DIRECT & INDIRECT EMPLOYMENT	5,224	3,480	5,023	13,727

Source: PNG Chamber of Mines and Petroleum.

The Chamber of Mines and Petroleum reckons that extractive industry creates 4 or 5 additional jobs in the rest of the national economy for each job directly tied to the work of exploration, construction and extraction. Evidence from other countries would suggest that the multiplier is not this large unless it includes people employed by on-site contractors. The number of people formally employed in the supply of goods and services of all kinds to the operators of major resource projects – including government regulators – is unlikely to be more than twice the number directly employed by the operators themselves. It is hard to estimate the additional number of jobs in the formal and informal sectors that might be involved in the supply of goods and services to this larger group of workers or to project area people whose livelihoods depend on compensation and royalty payments rather than wages (Baxter 2001; Brooksbank 2002).

It is also hard to estimate the number of jobs that exist in that branch of the informal economy which consists of alluvial or artisanal mining. In 2000, there were thought to be as many as 60,000 artisanal gold miners in PNG, although many of them only worked on a part-time basis (Susapu and Crispin 2001). Given the increase in the gold price over the past decade, the number of people involved in this activity, whether full-time or part-time, is likely to have grown much larger. Evidence collected for this study shows that there are now large numbers of artisanal miners operating in areas where there were hardly any ten years ago. The only scenario in which former artisanal miners are likely to gain formal employment on major resource projects is one in which a development licence is granted over the area in which they have been working and they acquire the status of preferred area people as a result. Likewise, when a major mining operation reaches the point of closure, former employees from the preferred area may revert to artisanal mining as a livelihood, especially if they do not have the skills required to gain formal employment in another part of the country.

Under normal circumstances the number of people formally employed in the resource sector, including those employed by on-site contractors, would not be greater than the 27,000 people (including smallholders) who are employed by the oil palm industry, which accounts for less than 10 percent of the total value of PNG's exports. Representatives of the oil palm industry are therefore inclined to argue that it the biggest private sector employer in the country. This argument is consistent with the belief held by many policy makers, that growth in the production of agricultural commodities must be key to the creation of more jobs in the national economy. However, if artisanal miners are regarded as a type of 'smallholder', and their numbers are added to the number of people formally employed in the resource sector, this argument does not hold water. The key difference between the oil palm industry and the mining industry is that the smallholders in the oil palm industry are in a relationship of mutual dependence with the nucleus estate operators, while artisanal miners are either regarded as a threat to the operation of a major mining project or else left to their own devices.

3.2 Impacts of the Recent Resource Boom

Evidence collected by the Bank of PNG from its own company surveys shows a lower rate of increase in the number of people formally employed in the resource sector than the rate estimated by the Chamber of Mines and Petroleum – about 70 percent instead of 200 percent since 2002 (Table 7). This discrepancy can largely be explained by the fact that many of the new jobs created by the resource boom are registered as jobs in the construction sector or other sectors of the national economy because of the way that employers have been classified. This explanation is consistent with the evidence from job advertisements published in PNG's national newspapers (Table 8). These have been classified in accordance with the standard industrial classification used by the PNG National Statistical Office. Here it can be seen that the number of jobs advertised in the construction sector has risen by a greater margin than the number advertised in the resource sector. But what is most remarkable about this dataset is the overall increase in the number of jobs being advertised across all sectors: the number of jobs almost doubled between 2002 and 2007, and almost doubled again between 2007 and 2012. There is no obvious way to explain this increase except by reference to the impact of the resource boom and other components of recent economic growth on the mobility of labour across several parts of the formal economy. Even a relatively small increase in the total volume of formal employment can create a much bigger increase in the number of job advertisements in a relatively small labour market.

Table 7: PNG employment index by sector, first quarter 2002, 2007 and 2012.

SECTOR	2002	2007	2012
Extractive industry	**100.0**	**116.4**	**172.7**
Primary industry	100.0	134.7	167.1
Manufacturing	100.0	136.8	181.5
Construction	100.0	130.9	180.6
Transport	100.0	116.2	151.9
Wholesale trade	100.0	159.0	199.4
Retail trade	100.0	111.3	138.0
Financial & other services	100.0	111.1	142.2
All non-extractive sectors	**100.0**	**127.3**	**162.7**

Source: Bank of Papua New Guinea.

Table 8: PNG job advertisements by industry, February-March 2002, 2007 and 2012.

INDUSTRY CATEGORY	2002 (%)	2007 (%)	2012 (%)
Agriculture, hunting & forestry	2.9	2.8	2.2
Fishing	2.2	0.0	0.0
Mining & quarrying	6.3	11.0	8.1
Manufacturing	6.4	3.7	3.7
Electricity, gas & water	1.0	1.8	0.6
Construction	6.8	14.9	17.7
Wholesale & retail trade & repairs	16.0	12.3	13.6
Hotels & restaurants	2.1	2.0	2.4
Transport, storage & communications	4.9	7.3	6.4
Financial intermediation	2.1	2.2	4.0
Real estate, renting & business services	23.6	19.3	26.3
Public administration & defence	4.9	2.5	2.5
Education	7.5	6.0	1.4
Health & social work	3.0	0.6	2.3
Other community, social & personal services	4.7	4.7	3.1
Private household with employed persons	0.1	0.1	0.0
Extra-territorial organization & bodies	4.2	8.1	5.5
Unspecified	1.2	0.7	0.2
TOTAL JOBS ADVERTISED	730	1442	2828

Source: Data collected for present study.

The job advertisements have also been classified by reference to the standard occupational classification used by the PNG National Statistical Office. In this instance, the advertisements were assigned a three-digit rather than a two-digit code, and were then grouped into occupational categories that are somewhat different from those officially distinguished at the two-digit level. There is not much evidence to indicate an unusual rate of increase in the number of jobs being advertised in particular occupational categories, but it seems that many of the jobs advertised for physical and engineering science professionals and associates, metal and machinery trades workers, and drivers and mobile machine operators have been linked to the booming resource sector (Table 9). This observation is supported by analysis of the types of jobs being advertised by mining and petroleum companies alone during the three two-month periods for which this type of data was collected (Table 10).

Table 9: PNG job advertisements by occupation, February-March 2002, 2007 and 2012.

OCCUPATIONAL CATEGORY	2002 (%)	2007 (%)	2012 (%)
Senior executives, general managers & branch managers	1.8	2.2	1.4
Specialized (divisional/departmental) managers	4.1	4.6	3.4
Physical & engineering science professionals & associates	5.8	11.5	7.0
Life science & health professionals & associates	5.1	2.1	2.7
Education & training professionals & associates	6.2	4.6	2.1
Business & legal professionals & associates	15.5	15.0	12.3
Aid project staff, applied social scientists & associates	1.8	5.3	3.4
Media & sports professionals & associates	1.9	0.9	0.6
Clerical workers & junior sales staff	12.1	9.4	10.5
Providers of miscellaneous personal services	2.7	1.7	3.9
Security service providers & supervisors	12.9	5.7	16.0
Mineral extraction and processing workers	1.9	1.8	1.4
Building & construction workers & supervisors	1.8	6.3	7.9
Metal & machinery trades workers & supervisors	17.0	20.7	17.1
Drivers & mobile machine operators & supervisors	3.6	6.2	8.6
Miscellaneous manual workers & supervisors	6.0	2.0	1.9
TOTAL JOBS ADVERTISED	730	1442	2828

Source: Data collected for present study.

Table 10: Jobs advertised by mining and petroleum companies, February-March 2002, 2007 and 2012.

OCCUPATIONAL CATEGORY	%
Senior executives, general managers & branch managers	0.0
Specialized (divisional/departmental) managers	3.2
Physical & engineering science professionals & associates	24.2
Life science & health professionals & associates	3.0
Education & training professionals & associates	3.2
Business & legal professionals & associates	6.7
Aid project staff, applied social scientists & associates	1.4
Media & sports professionals & associates	0.7
Clerical workers & junior sales staff	2.8
Providers of miscellaneous personal services	0.9
Security service providers & supervisors	4.8
Mineral extraction and processing workers	15.2
Building & construction workers & supervisors	0.9
Metal & machinery trades workers & supervisors	23.3
Drivers & mobile machine operators & supervisors	6.2
Miscellaneous manual workers & supervisors	3.5
TOTAL JOBS ADVERTISED	434

Source: Data collected for present study.

Nearly all of the jobs advertised in PNG's national newspapers are for citizens, not expatriates. Those advertised by mining and petroleum companies (or their contractors) may not provide an accurate picture of the occupational profile of the national workforce in the resource sector, first because there may be higher levels of labour mobility in some occupations than in others, and second because people from the preferred area – or even the host province – may be recruited by other means. Evidence from other sources suggests that the workforce in an operational resource project can be divided into four main segments:

- Expatriates occupy the most senior management positions and most specialized technical positions: they may account for less than 10 percent of the total workforce but more than 50 percent of the operator's total labour costs (Johnson 2012). This in itself constitutes a strong economic incentive for companies to implement their training and localization plans if they can find suitably qualified citizens.
- At the other end of the scale, preferred area employees may account for more than 50 percent of the workforce but less than 20 percent of the total labour costs. For obvious reasons, these workers are likely to include the least qualified members of the workforce, and their opportunity to exchange one job for another is limited by the fact that they are only preferred for employment if they stay within a project's area of preference (Brooksbank 2002).

In between are national employees who are recruited because of their qualifications rather than their place of origin, and they can be divided into two main groups by the nature of their qualifications:

- Some – like geologists, metallurgists or specialized plant operators – are qualified for jobs that can hardly be found outside the resource sector, so their capacity to find better jobs is largely dependent on the fortunes of the sector as a whole.
- Others – like electricians, clerical workers or community relations officers – are qualified for jobs that can be found in several sectors, and therefore find it easier to move between different parts of the national labour market.

Some of the more specialized workers have taken advantage of the resource boom in other countries to emigrate from PNG, thus increasing the competition between resident mining and petroleum companies for the services of those who remain. Meanwhile, recruitment of less specialized workers by mining and petroleum companies has created a shortage of skilled labour in other sectors of the national economy, which is one of the classic manifestations of the so-called Dutch Disease. In both cases, employers are confronted with some fundamental limits on the number of suitably qualified individuals graduating from PNG's tertiary education and training institutions, where the shortage of suitably qualified teachers has also become a major problem.

3.3 Job Creation Policies

Despite its central focus on business development, the PNG government's national vision statement also recognizes the need for a 'well educated, healthy, appropriately skilled, and honest work force that is committed, proactive and innovative' (GPNG 2009: 12), and treats 'relevant education and job creation' as a strategic and political priority (ibid.: 22). The long-term national development plan puts some flesh on these bones by proposing that its own implementation will add more than 2 million jobs to the

900,000 that were thought to exist in both the formal and informal sectors of the national economy in 2010 (Table 11). This plan anticipates that 680,000 (34 percent) of the new jobs will result from the creation of formal property rights over customary land in both urban and rural areas, and another 600,000 (30 percent) from the resolution of law and order problems, primarily in urban areas (GPNG 2010a: 15).

Table 11: Projected job growth in PNG's long-term national development plan, 2010-2030.

TYPES OF JOBS	No Plan	With plan	Diff. (%)
Formal jobs in agricultural sector	44,800	592,900	1,223.4
Formal jobs in other sectors	167,500	1,128,300	573.6
Informal jobs in urban areas	5,400	48,800	803.7
Informal jobs in rural areas	144,800	266,300	83.9
TOTAL	362,500	2,036,300	461.7

Source: GPNG 2010a, Table 1H.

It has long been recognized that high rates of youth unemployment are associated with high rates of criminal activity, that this problem is especially acute in urban areas, and that it constitutes one of the biggest costs of doing business, and thus one of the main barriers to job creation (Levantis 1997b). One sign of this problem is the fact that 16 percent of the jobs formally advertised over a two-month period in 2012 were for security guards (see Table 9). It would be hard to make a case that security guards in PNG have jobs which are 'good for development', but much easier to make a case that criminal 'jobs' produce higher incomes for their occupants, which helps to explain why some security guards join the criminal fraternity, and more security guards are therefore needed. There is no ready-made policy solution to this type of wicked problem because it is not clear how many elements are contained in the vicious circle, let alone which one is most amenable to government intervention. For example, ordinary criminals justify their own activities by reference to the perceived corruption of the country's political elite, which is widely regarded as a factor in the growing gap between the incomes of the rich and the poor, but 'poor' criminals may have rich patrons in both the public and the private sector, and law enforcement agencies are not invariably on the right side of the law (Dinnen 2001). Nevertheless, additional public investment in these agencies is currently seen as the main strategy for creating another 600,000 jobs in the national economy by 2030 (GPNG 2010a: 46).

The job-creating potential of land reform is ascribed to the very high cost of securing access to the small amount of land that was alienated from customary ownership during the colonial period. This is the most significant barrier to expansion of small and medium scale enterprise in urban areas, and also the biggest driver of the recent increase in the urban cost of living, especially in the national capital. Port Moresby now ranks amongst the top three developing country capital cities for the price of hotel and rental accommodation. The weekly rent charged for the cheapest type of family home in the formal housing market is now four or five times the value of the minimum wage. The resource boom is widely blamed for the recent acceleration in urban land and housing prices, but has only served to compound a problem of scarcity which has been growing for decades. The PNG government decided to deal with this problem in 2005, before the recent acceleration started, when it established a National Land Development Taskforce (GPNG 2007b). Some of the recommendations of that body have since been

implemented in the form of legislation that for the first time enables customary landowners to register titles to their land and then lease it to third parties for development purposes. However, a scandal has since erupted around the use of an existing legal mechanism to alienate more than 10 percent of all the customary land in rural areas (Filer 2011). There is as yet little evidence that this process of dispossession has created a significant and sustainable number of new jobs, but rather more evidence that the Department of Lands may lack the capacity to implement the new legislation in a transparent and effective manner.

Government policy makers are aware that land availability and urban criminality are not the only major barriers to job creation. While PNG ranked 150th out of 176 countries listed in Transparency International's Corruption Perceptions Index in 2012, it also ranked 101st out of 183 countries listed in the World Bank's Ease of Doing Business Index, which means that it still has room for improvement in the regulation and facilitation of private sector investment (Bulman 2013). The government's latest budget papers include an undertaking to lower this cost of doing business, with a particular focus on the class of national entrepreneurs whose growth is central to the national vision statement (GPNG 2012b: 96). The government is also committed to additional investment in transport infrastructure and the electricity supply, which together constitute another major cost of doing business in both urban and rural areas. However, despite its recurrent undertakings to lower all such costs in various ways, the government has not articulated any new job creation strategies beyond those already contained in the long-term development plan.

4 THE QUALITY OF JOBS IN THE RESOURCE SECTOR

The main body of data collected for this study consists of interviews conducted between February and April 2012 with 285 PNG citizens currently or formerly employed in the resource sector. This survey was mainly designed to elicit information about the employment history of the individuals who were interviewed, their reasons for changing jobs, their levels of job satisfaction, their social activities, and their contributions to development in the form of economic support to other people in the areas from which they originated. The many constraints placed on the conduct of this survey mean that none of the different groups of people who were interviewed can be regarded as a representative sample of any larger group of people, so the results can only be taken as a form of anecdotal evidence.

Of the 285 interviews, 180 were conducted with PNG citizens currently employed by private companies in the resource sector within PNG. This is taken to be a sample of the 'mainstream workforce' in the resource sector, and is henceforth called the mainstream sample. The distribution of these workers between occupational categories is similar to the distribution of jobs advertised by mining and petroleum companies in the national newspapers (Table 10). It is known that preferred area employees and employees of on-site contractors are under-represented in this sample. The sample is also biased in favour of the mining sub-sector as opposed to the petroleum sub-sector and in favour of operational projects as opposed to exploration and construction. The sample also contains a higher proportion of female workers than is characteristic of the large-scale mining industry as a whole. More than 20 percent of the workers in the sample are women, compared with an average of 10 percent in PNG's three biggest mining operations (Table 6).

Of the remaining 105 interviews, 45 were conducted with PNG citizens who have emigrated to take up jobs in the resource sector overseas. The results of these interviews are considered in Section 4.4 below. The other 60 interviews were conducted with 41 men and 19 women whose employment was indirectly related to private company employment in the resource sector: 15 of them were employed in the Mineral Resources Authority, which is a government agency responsible for regulating the mining industry; the other 45 had formerly been employed by a private company in the resource sector but were now employed in another branch of the national economy. Of these 45 workers, 24 had been employed by Bougainville Copper Ltd or its contractors before the Panguna mine was forcibly closed by an armed rebellion in 1989, and 13 had been employed by Misima Mines Ltd before its mining operation was peacefully closed in 2004. Despite the peculiar social composition of this group, we refer to it as a 'control group' for the purpose of comparison with our mainstream sample.

4.1 A Gendered Job Stream

There are some notable discrepancies between the profiles of the male and female workers in our mainstream sample. The average age of the women was a good deal lower than the average age of the men: 85 percent of the women, but only 48 percent of the men, were under 40 years old, while 41 percent of the women, but only 19 percent of the men, were under 30 years old. There was a similar discrepancy in fortnightly pay rates: 82 percent of the women, but only 68 percent of the men, said that they took home less than K2000 a fortnight, while 41 percent of the women, but only 17 percent of the men, said they took home less than K800. These disparities were not found in the control group, where all the women and all but one of the men were over 30 years old, and 54 percent of the men, but only 26 percent of the women, were earning less than K800. They are consistent with a hypothesis that women tend to drop out of jobs in the resource sector when they get married and have a certain number of children. The men in the mainstream sample had an average of 3.8 children each, whereas the women had an average of 1.8 children, and 59 percent of the men, but less than 3 percent of the women, said they had a spouse who was not currently employed. The women in the control group had an average of 3 children each. We might imagine that women with young children would be inclined to drop out of the resource sector workforce rather than the face the prospect of working on a fly-in-fly-out (or drive-in-drive-out) basis. However, our survey data show that the women who worked on a long rotation had a somewhat higher average number of children than those who travelled from home to work each day.

The women in the mainstream sample had a narrower range of educational qualifications than the men. All the women had a minimum of ten years of formal schooling, but only one had postgraduate qualifications. Nevertheless, 44 percent of the women, as against 39 percent of the men, had university degrees. A similar pattern was observed in the control group. If female graduates in the mainstream sample were not earning as much as their male counterparts, the difference might be explained by their relative youth or inexperience, if not by some form of gender discrimination. It might also be explained in part by the concentration of men in more specialized technical jobs, and the greater likelihood that women will occupy clerical jobs of the sort found in many parts of the national economy. However, while 41 percent of the women in the sample did indeed have clerical jobs, 28 percent had more specialized technical jobs – the same proportion as the men in the sample.

One of the most interesting gender discrepancies in the mainstream sample is the length of time spent in particular jobs. The women had been in their current job for an average of 3.1 years (with a maximum of 16 years), while the men had been in their current job for an average of 4 years (with a maximum of 31). The women had been in their previous jobs for an average of 2.6 years (with a maximum of 12), while the men had been in their previous jobs for an average of 4.2 years (with a maximum of 17). The most plausible explanation of this discrepancy is that workers tend to stay longer in the same job as they grow older, so the higher rate of turnover amongst the women is due to their lower average age. A similar gender difference was observed in the control group, but workers in this group had changed jobs less frequently on average, possibly because of their higher average age, and the figures were distorted by the fact that more of them had been in the same job for many years.

The discrepancy between men and women in the mainstream sample disappears if attention is confined to their history of employment over the past decade instead of their whole career: both men and women had held an average of 2.6 jobs over that period. Male and female workers were equally likely to have held a job outside the resource sector before taking up a job inside it, but the evidence indicates that once they do have a job in the resource sector, their next job is likely to be in the resource sector as well. Experience of jobs outside the resource sector did not appear to vary significantly between workers in different age groups or on different rates of pay. However, the rate of movement between jobs did seem to reach a peak amongst workers in their thirties and those earning more than K2000 a fortnight. Workers in these categories had held an average of more than three jobs in the course of the previous decade.

The workers in the mainstream sample gave a wide variety of reasons for leaving their previous jobs, and their reasons are not easily classified. An inadequate career path was one of the most frequently mentioned reasons, and accounted for 22 percent of the main reasons cited by the women, as opposed to 12 percent of those cited by the men. On the other hand, internal promotion accounted for 34 percent of the main reasons given by the women, compared with 12 percent of those given by the men. This evidence seems to suggest that the women were both more active and more successful in seeking to advance their careers without changing their employers or having to change their place of residence. While better terms and conditions accounted for 27 percent of the main reasons given by the men for changing jobs – and incidentally changing employers – they only accounted for 19 percent of the women's main reasons. Redundancy or termination accounted for 24 percent of main reasons given by the men, but only 12 percent of those given by the women. It is also interesting that family or personal reasons were cited eighteen times by the men, but only once amongst the 65 reasons given by the women.

Only two of these gender discrepancies were clearly evident in the responses of the control group. One was the greater likelihood that men would cite redundancy or termination as the main reason for changing their jobs. That is readily explained by the number of men in the group who had formerly worked on mining projects which had closed. The other point of consistency between the two samples was that women were more likely to cite the inadequacy of their career path as a reason for changing jobs and changing employers. In this group it accounted for 15 percent of the reasons given by the women but only 1 percent of those given by the men.

There was not much difference between the men and women in either the mainstream sample or the control group in their statements about job satisfaction. More than half of the men and women in the mainstream sample said that what they most liked about their current job was some quality of the job itself. The women were marginally more likely to say that relationships with other people in their workplace was what they most liked, or what they least liked, about their current job. They were more likely to complain about shift work or working hours, but less likely to complain about travelling or commuting to work. Fifteen of the men but none of the women cited organizational complexity or bureaucracy as their main complaint. A similar pattern was evident in the responses of the control group. The only noticeable differences were in the responses of the men. On the one hand, 34 percent of the men in the control group, compared to 9 percent of men in the mainstream sample, said that what they most liked about their job was their relationships with people outside the organization for which they worked or their contribution to community development. On the other hand, 27 percent of the men in the control group, compared to 9 percent of those in the mainstream sample, said that what they least liked about their job was the wages and benefits. The second difference is understandable in light of the fact that 54 percent of the men in the control group, compared to 17 percent of those in the mainstream sample, were earning less than K800 a fortnight.

4.2 Measures of Social Cohesion

To assess the contribution of workers to social cohesion or social capital, we first assigned them to one of three categories by comparing their own province of birth with that of both their parents and (if they were married) with that of their spouse. The most 'parochial' workers were those who had only one provincial affiliation in this sense, while the most 'cosmopolitan' workers were those who had three or four. We then asked each of the workers how they allocated their spare time (outside of work) between different social activities, and who they associated with in the social activity that took up most of their spare time. Their associates could be 'workmates who are also wantoks', 'workmates who are not wantoks', 'wantoks who are not workmates', or 'friends who are neither workmates nor wantoks.' The Tok Pisin term *wantok* literally refers to someone who speaks the same language as oneself, but it is also used more widely to refer to people who come from the same place or area, and the extent of this place or area varies with the context in which the term is used. In the national context, it could refer to people who come from the same province (of which there are 21 outside the national capital) or to the same district (of which there are 86 outside the national capital). Or it could refer to people who really do speak the same vernacular language, of which there are more than 800 altogether, some of which are spoken by most or all of the traditional inhabitants of a single district, but many of which are spoken by much smaller groups of people. There has been much debate about whether the so-called 'wantok system', in which people prefer to associate with their wantoks in various ways, should be regarded as a sort of social safety net or as an obstacle to the formation of social capital (de Renzio and Kavanamur 1999). It could be both of these things at the same time, but in national political debate, it often carries connotations of nepotism, clientelism and corruption.

There is a general assumption in PNG that people's sense of national identity is related to the number of their provincial affiliations, and that this in turn is likely to reflect their level of education and income. Our survey made no attempt to assess people's sense of national identity. We did find a connection

between the number of provincial affiliations and people's level of education and income, but it was not as strong as might have been expected. In our mainstream sample, exactly half of the workers earning less than K800 a fortnight had only one provincial affiliation, but the proportion rose to 63 percent amongst those earning between K800 and K1990, and then fell to 33 percent amongst those earning more than K2000. The proportion of workers having three or four provincial affiliations was 13 percent in the two lower income brackets and 23 percent in the higher one. In the control group, 81 percent of the workers earning less than K800 a fortnight, but 45 percent of those earning more than this, had only one provincial affiliation, while 30 percent of those earning more than K800 had three or four provincial affiliations.

There was somewhat stronger evidence of an inverse relationship between parochialism and the level of education. Out of 97 holders of university degrees in both samples combined, 40 percent had only one provincial affiliation, while 37 percent had two, and 23 percent had three or four. Out of 143 workers with lower levels of formal education, 65 percent had only one provincial affiliation, while 25 percent had two, and 11 percent had three or four. But the relationship with the sex of the worker was just as strong. Out of 182 male workers in both samples combined, 61 percent had only one provincial affiliation, while 27 percent had two, and 12 percent had three or four. Out of 58 female workers, 36 percent had only one provincial affiliation, while 34 percent had two, and 29 percent had three or four.

Although our survey respondents were asked to specify the number of hours spent on each of their leisure activities in the previous week, their responses were hard to interpret because some workers said that they had spent more time on these activities than could reasonably be expected in the course of a normal working week. That is because some of them were fly-in-fly-out (or drive-in-drive-out) workers who had been on field break in the previous week and were therefore not at work. We therefore assigned preference-rank scores to each of the activities on which they said they spent some number of hours, with a top score of seven being assigned to the one on which they spent most time. This means that our respondents are not all equally represented in the ranking of preferences because some of them said they spent time on several different activities while others only specified one activity or no activities at all.

There were 169 workers in the mainstream sample and 56 workers in the control group who specified at least one social activity. Out of six types of activity that were presented as alternatives in our survey form, church attendance was the most popular amongst workers in the mainstream sample, with an average preference rank score of 3.5. This was followed by customary activities (3.2), business activities (3.0), sporting activities (2.2), drinking and/or gambling (2.2), and political activities (0.8). Church attendance was even more popular amongst workers in the control group, with an average preference score of 4.4. This was followed by sporting activities (2.3), business activities (2.1), customary activities (2.1), drinking and/or gambling (2.1), and political activities (0.9). In both groups, the preference for church attendance was inversely related to the number of provincial affiliations, but there was otherwise no consistent relationship between evidence of 'parochialism' and the preferences expressed for different types of social activity. One odd discrepancy between workers in the two groups was that those in the mainstream sample with one or two provincial affiliation expressed a markedly greater preference for customary activities than those with three or four provincial affiliations, whereas this relationship was almost exactly reversed amongst members of the control group.

The preference for church attendance was also inversely related to levels of fortnightly income, though not very markedly. There was otherwise very little evidence of a relationship between income levels and preferred social activities, except for a notable tendency for workers in higher income brackets to express a greater preference for business as a form of leisure activity than those in lower income brackets. Amongst workers in the mainstream sample, business was in fact the most popular activity for those earning more than K4000 a fortnight, and the second most popular activity (after church attendance) for those earning between K2000 and K4000 a fortnight. The greater popularity of business as a spare-time activity amongst workers in the mainstream sample, as compared with those in the control group, may reflect the fact that almost 40 percent of the workers in the mainstream sample had field breaks of at least a week in which they would have greater opportunity to engage in some additional income-earning activity.

There were 172 workers in the mainstream sample and 54 workers in the control group who specified the type of people with whom they associated in the social activity that took up most of their spare time. Workers in both groups expressed the same order of preference. Friends who were neither workmates nor wantoks were the preferred associates of 42 percent of the workers in the mainstream sample and 65 percent of those in the control group. Wantoks who were not workmates were preferred by 35 percent of the workers in the mainstream sample and 26 percent of those in the control group. Workmates who were not wantoks were preferred by 13 percent of the workers in the mainstream sample and 6 percent of those in the control group. And workmates who were also wantoks were preferred by 9 percent of those in the mainstream sample and 4 percent of those in the control group.

As we might expect, the preference for association with wantoks (whether workmates or not) was inversely related to the number of provincial affiliations amongst workers in the mainstream sample. This preference was expressed by 53 percent of the workers who had only one provincial affiliation, but only 35 percent of those who had two or more. However, there was no sign of the same pattern in the control group, where only 29 percent of workers with a single provincial affiliation expressed a preference for association with wantoks. There is rather more evidence of an inverse relationship between this preference and levels of income in both groups. In the mainstream sample, the preference for association with wantoks was expressed by 48 percent of the workers earning less than K2000 a fortnight, and 35 percent of those earning more. In the control group, it was expressed by 43 percent of the workers earning less than K800 a fortnight, and 19 percent of those earning more.

Gender had as much to do with these types of social preference as levels of income or the number of provincial affiliations. Female workers in both the mainstream sample and the control group spent more time in church, more time on business, less time on sport, less time on politics, and less time on drinking and gambling, than did their male counterparts. Here again, customary activities are a bit of a puzzle. The women in the mainstream sample said they spent less time on such activities than their male counterparts, but those in the control group said they spent quite a lot more. The two groups differ in another interesting way. In the mainstream sample, a preference for association with people who were not wantoks was expressed by 76 percent of the women as against 50 percent of the men. But in the control group, the same preference was expressed by 72 percent of the men as against 33 percent of the women.

This part of our survey findings does not provide a clear indication of what it is about a job or a worker that contributes to social cohesion or social capital formation. We did not ask our respondents what type of job or worker made the greatest contribution in their own opinion, nor are we aware of any previous surveys in PNG that have sought to rank occupations in this way. If we had asked a question along these lines, we suspect that many of our respondents would not have understood the meaning of it, and those who did would most likely have nominated priests or pastors at the top of the pecking order and politicians at the bottom. This would seem like a statement of the obvious, given their stated preference for church attendance over politics as a spare time social activity.

4.3 Inter-Household Transfers

Workers in this survey were asked to specify their contributions to development 'at home' in the previous year (2011) under three main headings:

1. Goods supplied as gifts to relatives outside of the worker's own nuclear family.
2. Payments of cash to meet a variety of expenses on behalf of such relatives.
3. Accommodation of rural relatives for various periods of time by workers resident in urban areas.

Out of 180 workers in the mainstream sample, 91 percent claimed to make one or both of the first two types of remittance. The same claim was made by 92 percent of the 60 workers in the control group. The men in both groups had a slight preference for making remittances in cash, while the women had a slight preference for making remittances in kind. Out of 143 town-based workers in the mainstream sample, 55 percent claimed to have hosted rural relatives in their homes during the previous year. In this case also, workers in the control group showed a similar disposition, and there was no significant difference between the proportion of men and women making this claim in either of the two samples.

Nearly all of the workers who said that they made one or both of the first two types of remittance went on to specify their content or their purpose or their monetary value. The combined value of remittances in kind made by 115 workers in the mainstream sample was just over K1 million. The combined value of remittances in cash made by 152 workers in this sample was almost K1.2 million. Amongst members of the control group, 39 workers claimed remittances in kind with a combined value of around K413,000, while 48 claimed remittances in cash with a combined value of around K248,000.

The proportion of these remittances that could be counted as contributions to the formation of physical, human or social capital, as opposed to personal consumption, was remarkably high. Almost 80 percent of the value of remittances in kind made by workers in both samples was said to consist of construction and building materials, working tools and equipment, or means of transport (including vehicles, motors, parts and fuel). The rest was spread between household furniture and appliances, food, clothing and accessories, mobile phones and digital devices, and other miscellaneous items. The purchase of building materials and means of transport was said to account for more than 14 percent of the combined value of cash remittances made by both groups of workers. The payment of school fees for relatives was said to account for more than 23 percent of this combined value. The balance of the cash remittances was allocated between funeral expenses, compensation payments, brideprice payments, other customary activities, church activities, travel expenses, medical expenses, and other

miscellaneous expenditures. Funeral expenses were the largest single item specified in this list of additional expenses, accounting for 13 percent of the total spending.

Some doubt could be cast on the validity of the monetary values in these calculations because a few of the workers claimed to have made remittances with values in excess of their net annual salaries. These claims could make sense in terms of the sheer cost of things like public motor vehicles (mini-buses) and the fact that their purchase would count as a form of business investment on which a profit would be made in future. If the claims were correct, then the workers must have engaged in a very high level of saving or borrowing in order to afford them. On the other hand, if the combined value of remittances in cash and in kind has been inflated by excessive and implausible claims on the part of a small number of workers, there are other reasons to think that some of the remittances made by workers in the sample have not been counted at all. Aside from the fact that some workers claimed to have made such remittances but then failed to specify their content or value, all workers in the survey were only asked to specify their four most significant contributions under each heading over the course of the year. Even on the most conservative estimate, with median values substituted for mean values in each spending category, it would appear that workers in the mainstream sample spent around K1.2 million on both types of remittance in 2011, while workers in the control group spent around K180,000.

As might be expected, the value of both types of remittance is related to the income level of the workers making them, and this is the case for both mean and median values within each of our two groups of workers (Tables 12 and 13). However, this discrepancy between the mean and median values in both groups means that it is hard to determine what proportion of a worker's disposable income was being devoted to these types of remittance. It could be as low as 10 percent but it could well be more than 20 percent. In general, our findings are consistent with those of previous studies which have investigated the social and economic significance of remittances from town-based workers to rural villagers in PNG (Morauta 1984; Carrier and Carrier 1989; Dalsgaard 2013). We did not ask our town-based respondents for information about transfers to other urban households, since this would have added too much complexity to our interview schedules, but there is published evidence that such transfers are also important as a mechanism for urban poverty alleviation (Monsell-Davis 1993; Gibson et al. 1998).

Table 12: Workers in mainstream sample who specified remittances in kind and/or cash, by fortnightly pay rates and remittance values.

PAY RATES	BOTH	KIND	CASH	VALUE	MAX	MEAN	MEDIAN
< K800	22	1	6	137,075	20,000	4,727	2,400
K800 - K1990	49	6	26	753,655	135,000	9,421	5,500
K2000 - K4000	25	2	8	734,405	106,350	20,983	10,500
> K4000	10	0	6	638,850	150,000	39,928	22,000
TOTAL	106	9	46	2,263,985	150,000	14,150	6,550

Source: Interview data collected for present study.

Table 13: Workers in control group who specified remittances in kind and/or cash, by fortnightly pay rates and remittance values.

PAY RATES	BOTH	KIND	CASH	VALUE	MAX	MEAN	MEDIAN
< K800	12	2	9	57,145	22,800	2,485	1,280
K800 - K1990	14	3	5	348,050	175,000	15,820	6,500
> K2000	6	2	2	255,800	100,000	25,580	7,000
TOTAL	32	7	16	660,995	175,000	12,018	3,000

Source: Interview data collected for present study.

The proportion of town-based workers accommodating rural relatives for various periods of time was also fairly constant across different income categories. This practice represents a hidden form of remittance to the extent that the hosts are normally liable to pay for the food consumed by their guests, sometimes for the cost of their attendance at educational institutions, and often for the cost of their travel back home at the end of their stay. On the other hand, guests often provide assistance with housework and childcare, and that could be counted as a reverse form of remittance or subsidy. It is not possible to establish the distribution of costs and benefits in this type of relationship because the participants make no such calculation themselves.

In our mainstream sample: 60 percent of the 408 guests accommodated by 79 workers stayed for more than a month, and 33 percent stayed for more than six months; 25 percent were said to be mainly helping with childcare, while 21 percent were apparently being educated at the expense of their hosts. In our control group: 37 percent of the 129 guests accommodated by 27 workers stayed for more than a month, and 26 percent stayed for more than six months; 16 percent were said to be mainly helping with childcare, while 19 percent were apparently being educated at the expense of their hosts. The higher proportion of guests providing assistance with childcare in the mainstream sample reflects the fact that 20 percent of the children reported by members of the control group were already old enough to have jobs of their own, so there were not so many families in this group with young children in need of daily care. It might be argued that the presence of relatives helping with childcare in the mainstream sample is one of the factors that explain why some of the married women in this sample were able to remain in the formal sector workforce, and even commute to work on a long rotation, despite having young children. However, our survey responses do not support this argument. Only 15 percent of the 110 guests reported by 19 female workers in the sample were said to be mainly helping with childcare, as against 30 percent of the 298 guests reported by 60 male workers.

4.4 International Migration

There is no hard evidence on the number of Papua New Guineans who have left their country to take up jobs in the resource sector overseas, but the number is thought to be substantial. Anecdotal evidence suggests it is somewhere between 700 and 1000. Most of these emigrants are likely to be highly skilled and specialized workers, since Papua New Guineans do not have easy access to any labour markets outside the Pacific Island region. Their departure would therefore be one of the key factors behind the occupational mobility of those workers with equivalent qualifications who have remained in PNG.

For the purpose of the present study, interviews were conducted with 45 Papua New Guinean expatriates employed in the resource sector, of whom 39 were based in Australia and six in other countries. In the absence of any sampling frame, these workers could only be identified by a snowballing technique that made use of personal networks, and like our mainstream sample, it is probably biased in favour of the more highly qualified and well-paid workers in the total population of migrant mine workers. The sample is not obviously skewed towards any particular region or province of origin in PNG, and does not include anyone from a community located close to an existing resource project who might have obtained a special benefit from application of the preferred area policy.

This sample of 45 expatriate workers comprised 40 men (37 of whom were aged between 30 and 49) and five women (four of whom were aged between 30 and 39). They had all grown up in PNG, 84 percent had university degrees, and 29 percent had additional postgraduate qualifications. Sixty percent would count as 'physical and engineering science professionals and associates' in our occupational classification, which is more than twice the proportion in our mainstream sample. All but four had fortnightly take-home pay equivalent to at least 2000 Australian (or American) dollars, and 22 (49 percent) earned more than $4000 a fortnight. They were clearly a well-qualified and well-paid group of workers.

All the workers in this sample seem to have been employed in the PNG resource sector before migrating overseas. They had been in their current job for an average of 2 years, compared with an average of 3.8 years for workers in the mainstream sample; they had been in each of their previous jobs for an average of 3.3 years, compared with an average of 3.9 years for workers in the mainstream sample; and they had held an average of 3.3 jobs in the last 10 years, compared with an average of 2.6 jobs for workers in the mainstream sample. They were notably more likely than workers in the mainstream sample to say that their main reason for changing jobs had been the receipt of a better job offer from an alternative employer or the belief that their previous job offered an inadequate career path. There were few significant differences between the two groups in their statements about job satisfaction, but there was an interesting difference within the migrant group. Of the 23 earning less than $4000 a fortnight, ten said the thing they least liked about their job was either the travel to work or the absence from friends and relatives, while ten of the 22 earning more than $4000 a fortnight specified their relationships with other workers in the workplace as the greatest source of dissatisfaction.

Out of this sample of 45 workers, 38 were currently married, 3 were divorced or separated, and 4 were not married yet. Of those currently married, 21 had spouses who were also in paid employment. All but two of the spouses were clearly identified as other Papua New Guineans. The 45 workers had 109 children between them, 88 of whom were at school, but none of whom already had jobs of their own. Nearly all of these additional family members were living with their partners or parents. If this sample is typical of the larger population of migrant mine workers, then each group of 100 migrant workers from PNG would be accompanied by more than 300 Papua New Guinean family members (including the children born overseas).

When compared with the mainstream sample, the migrant workers said they spent less of their leisure time on church activities and business activities, a lot less on customary activities, none at all on political activities, but more on sporting activities and drinking or gambling, and more on other social activities

which they did not specify. The only workers in this group who spent any time on 'customary activities' were those earning more than $4000 a fortnight, but those earning less than $4000 a fortnight were less active in all identifiable forms of social activity except for drinking and gambling. Only four of the 45 migrant workers said that they associated with friends who were neither workmates nor 'wantoks' in their primary leisure activity, compared with 41 percent of the workers in the mainstream sample. This might seem a little odd, but the migrant workers would most likely apply the term 'wantok' to any other Papua New Guinean, while those still living in PNG would restrict the reference to people from the same province or from an even smaller group. Even so, 20 of the 45 migrant workers said that they pursued their favourite social activity with workmates who were not 'wantoks', and this preference was unrelated to their level of income, despite the complaints made about work relationships by those earning more than $4000 a fortnight.

All of the migrant workers in our sample made remittances in cash or kind or both to relatives at home in PNG, and specified the content and value of such remittances. Their pattern of spending on different items is quite similar to that of their counterparts in PNG (Table 14). The mean and median values of the remittances made by these workers also vary with their level of income, but not to the same extent. The mean annual value of all remittances made by workers earning more than $4000 a fortnight was $9618, while the median value was $4195. The corresponding figures for those earning less than $4000 a fortnight were $3874 and $3500. Given that the Australian and American dollars were both worth about two PNG kina in 2011, the values are comparable to those of the remittances made by workers in the mainstream sample. However, this rate of exchange meant that the migrant workers were earning two or three times more than their mainstream counterparts in comparable jobs, so the proportion of their disposable incomes devoted to remittances was two or three times lower. Furthermore, the expatriate workers accommodated a much smaller number of visiting relatives, and the visitors stayed for much shorter periods of time, because of visa restrictions imposed by the countries where they were living. It is not clear whether this discrepancy was a function of the ability of expatriate workers to literally distance themselves from the pressure of relatives at home, or whether it was due to the greater real costs of living overseas. It might also have been due to a relatively inelastic demand for remittances, or the failure of relatives at home to realize how much their relatives overseas were actually earning. Whatever the explanation, the value of remittances from expatriate workers should not be underestimated.

Table 14: Workers in migrant sample who specified remittances in kind and/or cash, by fortnightly pay rates and remittance values.

PAY RATES	BOTH	KIND	CASH	VALUE	MAX	MEAN	MEDIAN
< $4000	18	3	2	89,110	13,700	3,874	3,500
> $4000	16	4	2	211,590	68,000	9,618	4,195
TOTAL	34	7	4	300,700	68,000	6,682	4,000

Source: Interview data collected for present study.

Even if there are 1000 migrants from PNG working in the resource sector overseas, this is a very small number by any standard measure of international labour migration. However, it seems more significant when we consider the very limited avenues for Papua New Guineans to gain any form of overseas

employment. These limitations are even evident in Australia, despite its physical proximity to PNG and its status as the former colonial power. According to the 2011 national census, there are less than 9000 people living in Australia who claim that their 'primary ancestry' is Papua New Guinean – which basically means that both of their parents would count as 'automatic' (indigenous) citizens of PNG. About 1500 of these people are Papua New Guinean women who have migrated to Australia as a result of marriage to men who are not Papua New Guineans. At any one time, about 2000 are students (or members of their families) who normally return to PNG on the completion of their studies. The available evidence suggests that workers in the resource sector, together with their families, account for anything between 2000 and 2500 members of the primary Papua New Guinean community in Australia. Some of these people may now be Australian citizens, but most of them have permanent or temporary residence visas.

The Australian census counted 613 PNG-born workers in the resource sector in 2011. We cannot tell how many of them claimed PNG as the site of their 'primary ancestry' because answers to the ancestry question, unlike answers to the separate question about country of birth, have not been related to the occupational data, and most of the Australian residents born in PNG are the children of expatriates who formerly lived and worked there. However, the vast majority of the PNG-born workers in the resource sector seem to be 'real' Papua New Guineans who have arrived in Australia since the start of the resource boom, like the 39 individuals in our sample of migrant workers. This estimate is supported by data from the Australian Department of Immigration and Citizenship. Out of 327 PNG citizens holding work-related temporary residence visas in the middle of 2012, almost three quarters (238) had been sponsored by employers in the mining industry. Over the course of the two preceding years, 354 PNG citizens arrived in Australia on this type of visa, while 764 seem to have acquired permanent residence as a result of their employment, and 366 as a result of their family connections. These numbers are consistent with the argument that employment opportunities in the resource sector have accounted for a net influx of 600 PNG citizens in recent years. To judge by the dependency ratios in our sample, it is likely that these individuals and their families account for more than 25 percent of the wholly indigenous Papua New Guineans now living in Australia.

The Australian government has recently been promoting a scheme through which Pacific Island economies can be strengthened by remittances from workers employed in the Australian agricultural sector on a seasonal basis (mainly as fruit-pickers). According to the Australian Department of Immigration and Citizenship, 82 Papua New Guineans entered Australia under the Pacific Seasonal Worker Pilot Scheme between mid-2010 and mid-2012. A study of the operation of this scheme suggests that they are unlikely to have taken home more than $400,000 between them if they remained for the standard period of 6 months (Hay and Howes 2012). If 600 Papua New Guinean workers were employed full-time in the Australian resource sector over the same period, then our sample data suggests that their combined net pay would have been in the order of $120 million and the value of their combined remittances to PNG would have been in the order of $5.5 million, which is more than 12 times the value of the remittances attributed to the seasonal workers. That is before we even start to consider the present or future contribution of the partners and children of the 600 workers to PNG's social and economic development.

The 45 migrant workers in our sample regarded their expatriate status as a major achievement in its own right. This was not so much because they wished to dispense with their sense of national or ethnic

identity, but rather because they saw their 'escape' from PNG as a reflection of their experience and skill, and an opportunity to become part of a globalized professional industry workforce. Many said that the opportunity of providing a better education for their children was one of the main reasons for their emigration. International evidence suggests that the emigration of highly skilled workers from developing countries should not necessarily be regarded as a 'brain drain' because it can have a positive effect on human capital formation in their country of origin (Beine et al. 2011; Gibson and McKenzie 2011). It is unlikely to have a negative effect in PNG, first because the number of highly skilled emigrants is such a small proportion of the working age population, and second because a significant proportion of the migrants or their children may well go back to live and work in PNG at some point in their careers. Two of the men included in our mainstream sample had already held jobs with mining companies overseas before returning to take up their present jobs in PNG, and one of the men in our migrant sample was commuting to work in PNG from his home in Australia (Box 1). Workers living in Australia on temporary residence visas may have no choice but to return as the resource boom comes to an end and the number of jobs in the sector begins to shrink, while those who have become permanent residents can retain their residence rights even if they commute to work in PNG as fly-in-fly-out workers.

Box 1: A high-flying migrant worker.

Peter (not his real name) is a highly qualified petroleum engineer. He was amongst the last cohort of Papua New Guinean students to undertake the final two years of his secondary education at a boarding school in Australia under a scheme supported by the Australian government's aid program. While still at school he watched news coverage of the 1991 Gulf War, and when told that it was basically a war about oil, he decided that he would try to make a career out of understanding this vital substance. At that time, it was not possible to get an undergraduate degree in petroleum engineering at any Australian university, let alone a PNG university, so he enrolled for a degree in medicine at the University of PNG. After completing his science foundation year, he was lucky enough to win a scholarship to an American university to study his preferred subject. Having obtained a postgraduate certificate from a Japanese institution, he worked in PNG's Department of Petroleum and Energy for a while and then completed his higher education with a Masters degree from a Scottish university. He got a job in the Australian gas industry, and on that basis secured permanent residence in Australia. He now lives in Sydney with his Papua New Guinean wife and six children, but has recently taken a job back in PNG on a fly-in-fly-out basis, with 28 days working on site alternating with 28 days of field break. During his field breaks, Peter normally spends a week doing development work in his home village in one of PNG's highland provinces. His main project for the past year has been to plant hundreds of trees to make up for a serious shortage of timber suitable for building houses. His next project is to build a guesthouse and other facilities that will attract tourists to the area.

The main disincentive for this type of circular migration is the so-called dual salary system which operates in most branches of PNG's formal economy, including the resource sector (Imbun and Morris 2001). In this system, Papua New Guinean workers are generally paid less than half the amount paid to expatriate workers with the same formal qualifications. Employers justify this disparity by reference to the problem of recruiting expatriates with rare skills to work in a forbidding environment, or to the lower productivity of Papua New Guinean workers who may seem to possess these skills, or even to the perceived need to limit the income disparities within the national population in order to reduce the risk of social and political conflict between the rich and the poor. By creating new opportunities for skilled

Papua New Guinean workers to migrate to countries where they are paid on a par with all other workers, regardless of nationality or ethnicity, the resource boom has produced a paradox. If we leave aside the 9000 or 10,000 expatriate workers employed at the peak of the LNG Project's construction phase, the number of foreigners normally employed in the PNG resource sector, where they account for roughly half of the total wage bill, is now roughly equivalent to the number of Papua New Guineans who have taken jobs in the resource sector overseas. The main difference between the two groups is that most of the highly qualified expatriate workers in PNG's resource sector are commuting to work from homes in Australia or other countries, while most of the migrant Papua New Guinean workers have established themselves and their families in those same countries, even if some of them commute to work in remote locations from their family homes. Employers in PNG therefore find that the cost of training their national workforce continues to escalate as the best and brightest of the trainees escape to greener pastures. Anecdotal evidence indicates that the Papua New Guinean expatriates are generally unwilling to return unless they are paid as if they were foreigners in their own country – and in some cases they seem to have struck a satisfactory bargain as their condition for doing so.

If our mainstream sample is representative of the national workforce in the resource sector, then it raises the interesting possibility that the proportion of women in that workforce – especially those with university degrees – has actually been increasing as employers seek to fill the gaps created by the emigration of highly qualified male workers with workers who are less likely to follow in their footsteps. If the 10 percent of women in our sample of migrant workers is typical of the larger population of expatriate Papua New Guineans working in the resource sector, in the same way that it was until recently typical of the national workforce which stayed in PNG, then the 20 percent of women in our mainstream sample may signal this type of tactical response on the part of employers who reason that women – and especially married women – are less likely to look for job opportunities overseas.

5 JOBS IN THE RESOURCE PROJECT CYCLE

We now turn to an examination of the ways in which the creation or destruction of 'good jobs' inside and outside the resource sector is related to the preferred area policy and the life-cycle of major resource projects. First we examine the capacity of 'landowner companies' whose establishment has been subsidized under the terms of the preferred area policy to create jobs in other economic sectors that will outlast the life of the resource project with which they were initially associated. Then we consider the capacity of workers employed under the terms of that policy to find new jobs which are also good jobs when the policy no longer applies to them.

5.1 Job Creation by Landowner Companies

Landowner companies (or LANCOs for short) have no clear legal definition in PNG, but have become a significant part of the institutional landscape in the resource sector because of the business development provisions of the preferred area policy. Most are registered under the terms of the *Companies Act* as 'Division 4 companies', which limits the extent of their accountability to shareholders. What distinguishes LANCOs from other nationally owned companies is that their shareholders are the

customary owners of land within a particular area. In the resource sector, they are not necessarily owners of the land covered by project development licences, but can include the owners of any land that falls within a preferred area. There is no legal requirement for LANCOs to be broadly representative of all the landowners with an interest in a specific area of land, but attempts have been made to engineer this kind of representation by allocating shares to incorporated groups of landowners. Even then, if the articles of association do not limit the powers of board members, and the board members control the appointment of company managers, the shareholders or their representatives may have little influence. Directors often treat company assets in the same way that politicians treat government assets, and articles of association often allow the directors to award themselves large fees or loans without shareholder approval. There is widespread ignorance of the obligations which company directors owe to shareholders, and when those obligations are not met, disgruntled shareholders are sometimes inclined to dissociate themselves from the directors rather than seek to change the composition of the board (Whimp 1995).

LANCOs have proliferated around major resource projects as their directors and managers compete to benefit from the supply of goods and services to the developers and from the national government's provision of 'seed capital' under the terms of benefit-sharing agreements negotiated through the development forum. The bigger the project, the more intense the competition. There are thought to be hundreds of LANCOs competing for benefits from the construction phase of the LNG Project, some of which had already been established to compete for benefits from earlier oil export operations. In this case, LANCOs have started to compete for access to the K1.2 billion allocated to provincial governments as infrastructure development grants under the project's benefit-sharing agreements.

The developers of major resource projects have tried to strengthen the capacity of local LANCOs by appointing their own business development officers. These efforts have not been very successful, partly because the developers have tried to avoid the risk of alienating public opinion in their preferred areas by awarding contracts to a large number of small LANCOs, many of which have failed because of mismanagement or misappropriation. Amongst the few LANCOs that have survived and thrived are the so-called 'umbrella companies' whose principals have somehow managed to persuade the directors of many smaller LANCOs to become shareholders in their operations. Even these larger LANCOs have sometimes run into major financial difficulties and have had to be 'bailed out' by the developers who are normally their main customers (Brooksbank 2002).

One of the survival strategies adopted by the directors of the more successful LANCOs has been the formation of joint ventures with national or foreign companies that have already built a solid reputation in some particular line of business, such as catering or mechanical repairs. This strategy has reduced their dependence on managerial and financial support from the developers who are often their customers, but often at the expense of a new dependence on their joint venture partners. Once the joint venture partner takes over the management of the business, the LANCO can easily lose popular support in the preferred area because its own directors and managers lose the ability to distribute jobs, dividends and donations to other members of their local community. At the same time, their business is still constrained by its narrow customer base and the prospect that this will disappear when the local resource project reaches the point of closure.

A few of the umbrella LANCOs have managed to escape these forms of dependency by finding new customers outside the preferred area from which they originate, and even outside the resource sector, while retaining overall control of specific lines of business operated by wholly-owned subsidiary companies. One notable example of such an 'entrepreneurial' LANCO is Anitua, an umbrella company whose shareholders are six other LANCOs representing each of the six 'clans' on the Lihir group of islands and the business arm of the local-level government. One of its subsidiaries, National Catering Services Ltd (NCS), originally catered for the workforce at the Lihir gold mine, but now supplies this service at other mine sites and to other organizations outside the resource sector. The business was originally expanded through a joint venture with a foreign catering company that has since been discontinued. In early 2012, NCS employed around 1600 people, 96 percent of whom were Papua New Guineans, and most of whom were still Lihirians. The directors of the umbrella company have ensured that their subsidiary company maintains its own training and localization program, with specific emphasis on the training of Lihirian employees, while protecting NCS from the social pressures that have undermined the viability of many other LANCOs.

It is not clear whether the success of a handful of entrepreneurial LANCOs like Anitua has been dependent on the resource boom and other components of recent economic growth to an extent which makes them especially vulnerable in the event of an economic downturn. A few of the LANCOs that have emerged to compete for benefits derived from the construction of the LNG Project could be counted as entrepreneurial companies, but it is hard to say whether they will have time to diversify their operations and their customer base before the construction phase comes to an end in 2014, when the developer's demand for locally produced goods and services will shrink dramatically. If margins are compressed by weaker demand, the directors and managers of entrepreneurial LANCOs may struggle to maintain high levels of efficient investment if their local shareholders and employees seek a greater share of the profits they have made already, either through dividend payments or appointments to better paid jobs. The qualities of political leadership required of successful LANCO directors are not easily transferred without making their business operations vulnerable to new forms of political competition.

An effort was made to include a reasonable number of LANCO employees in the mainstream sample of workers interviewed for the purpose of this study in order to compare their experience of employment with that of other workers employed directly or indirectly by mining and petroleum companies. However, while some of the respondents did say that they were employed by LANCOs, their number is too small for this purpose, and some respondents evidently found it hard to distinguish between LANCOs and other on-site contractors.

While it is possible to argue that a few entrepreneurial LANCOs have made a positive contribution to the creation of good jobs, it is not clear that this contribution outweighs the enormous subsidies which a very large number of LANCOs have received from both resource developers and the national government under the terms of the preferred area policy. Most of the LANCOs in the resource sector are little more than rent-collecting agencies, if indeed they perform any economic function at all (Bainton and Macintyre 2013). Even if there is a recipe for the success of the few entrepreneurial LANCOs, it is hard to see how it could be incorporated into public policy without creating an additional incentive or excuse for the government to subsidize the much larger number of LANCOs that will never

match this record of success. It is clear from our interview data that many of the highly qualified and well-paid workers in the resource sector, whose employment has not been a function of the preferred area policy, would like to establish their own companies, and in some cases have already done so. Their companies would generally not count as landowner companies, but are not therefore less likely to create good jobs, even without the benefit of market-distorting subsidies.

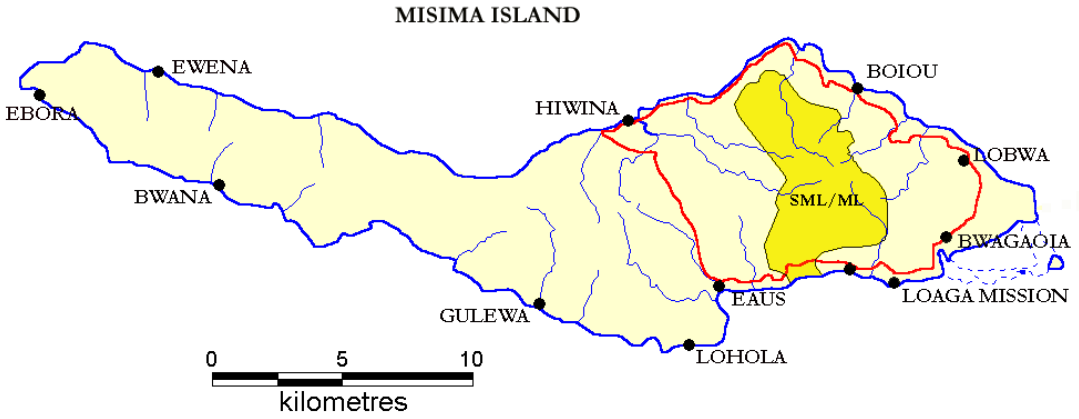
5.2 Impacts of Resource Project Closure

A gold mine on the island of Misima in Milne Bay Province is the only major resource project in PNG to have closed down in the course of the past decade. Two of us (Carr and Sagir) made a field trip to Misima in 2012 to assess the extent to which the preferred area policy had served to mitigate the negative impact of mine closure on the local community. No entrepreneurial landowner company emerged from the application of this policy to local business development. However, the operator of the mine was remarkably successful in its efforts to recruit most of its national workforce from Misima Island and the smaller neighbouring islands that belong to the Lousiade local-level government area. We were therefore interested to find out how many of the locally recruited workers had managed to find new jobs after the mine closed, and what contribution they were still making to the local economy.

Misima Mines Ltd received government approval to develop the mine in 1987. Gold production began in 1989, and the mine closed 15 years later in 2004. About 700 workers were employed on the operation during the 1990s, but the number was halved during the last four years as excavation ceased and existing stockpiles were processed. The number of locally recruited employees rose from 488 in 1989 to a peak of 642 in 1999, but had fallen to 307 by 2001, while the number of other Papua New Guinean employees rose from 6 in 1989 to a peak of 72 in 1998, but had fallen to 16 by 2001 (Finlayson 2002). Expatriate workers made up roughly 10 percent of the total workforce throughout the operation. At the peak of local employment in 1999, more than 15 percent of the men of working age in the Louisiade LLG area had jobs with the mine. There were never more than 40 local women in the workforce.

At the peak of local employment, wages and related benefits from the mining operation contributed about K10 million to the local economy in one year. Wages accounted for roughly three quarters of the monetary benefits which local people obtained from the operation during the 1990s (Finlayson 2002: 23). The rest mainly consisted of royalties and other payments to customary landowners of the mine lease areas (see Figure 1). The mining company also made significant improvements to the social and economic infrastructure on Misima island (ibid.: 24), but this was associated with a decline in the government's contribution to the delivery of public goods and services.

Figure 1: Area leased for the large-scale mining operation on Misima island, 1989-2004.



The national government did at least begin to show concern about the likely impacts of mine closure as soon as local workers began to be laid off. It was noted that some of the highly skilled local workers who had been trained by Misima Mines were already finding jobs with other mining companies (Jackson 2000: 40). However, the cash crops which had been the mainstay of the local economy before the mine was built had since been neglected. In the absence of any alternatives, and with the evident decline in public sector employment on the island, it was predicted that per capita cash incomes from local economic activities could fall to half their pre-mine levels, in real terms, after the mine had closed (ibid.: 5). The mining company did make some effort to revive the local agricultural economy in its last few years of operation, but not with any great success. In the five years following closure, letters to the national newspapers conveyed a sense of alarm and despondency at the evidence of economic decline and social disorder on the island (see Box 2). The government eventually took action by promising to spend K20 million on the rehabilitation of the economic infrastructure which the company had left behind, and gave another K6 million to a local business group to conduct feasibility studies on new economic development projects.

During a one-week visit to the island, we were able to interview 37 islanders (34 men and three women) who were formerly employed in on the mining operation and still had jobs in the formal economy. Twenty-four were fly-in-fly-out workers who still had jobs in the resource sector and had returned to the island on their field breaks. They are part of our mainstream sample of mine workers. The other 13 had jobs on the island itself, most of them being employed on the government's rehabilitation program. They are part of our control group. Aside from these people, we also conducted informal interviews with a number of people involved in what now appears to be the most lucrative informal economic activity on the island, which is the practice of artisanal or alluvial mining. Two of the workers in the control group were employed by the Misima Alluvial Gold Miners Association. This body only had 33 paid-up members at the time of our visit, but these are thought to be a fraction of the population engaged in alluvial mining.

Box 2: Signs of moral panic on Misima after mine closure.

In a letter published in the *Post-Courier* newspaper on 7 March 2009, the author listed the following indicators of social and economic decline on the island:

'Fast deterioration of buildings constructed under MML Tax Credit Scheme.

Non-existence of planned cocoa, copra and other agricultural rehabilitation projects.

People walking distances over ranges using bush tracks because once known mining era, roads have developed huge trenches on driveways caused by torrential downpours.

High hopes and dreams of sustainable luxurious lifestyle has plunged dramatically leaving the people in "adaptation syndrome".

Increased unprotected use of highly toxic chemical element "mercury" by small scale alluvial miners to fill the gaps of "lost heaven" standards experienced during 13 years mining era.

Increasing evidence of substance abuse and home brewing among young men.

Girls as young as 13 years old visiting boat crews for sex during anchorage, posing high HIV/AIDS risks in rural setting.

Elementary school children as young as eight years old are raped and murdered without culprit apprehension.

Alarming increase of incest, unlawful sexual penetration and carnal knowledge among villages and wards.

Youths frequenting station (Bwagaoia) aimlessly in search of free handouts from faithful friends and families.

Inconsistent telecommunication and banking system.

Decreased police manpower i.e. three regular constables for 18,000 plus people at ratio 1:6000.

Uncontrolled sky rocketing costs of basic goods and services.'

It is difficult to determine the total number of workers who used to work on the Misima mine and are still employed in the resource sector. Prior to mine closure, it was thought that very few of the locally recruited female workers would be likely to take jobs elsewhere, either because of family commitments on the island or because of their low levels of skill (Jackson 2000: 40). Of the 600 local men employed in 1999, our best estimate would be that 200 or 300 of them now have jobs with other resource projects, and of these, perhaps half are commuting to work from their homes in the Louisiade LLG area. The 24 whom we interviewed might therefore be 20-25 percent of this latter group. It is thought that some of the fly-in-fly-out workers who used to work on the Misima mine are not commuting from the island itself but from the provincial capital, or even the national capital, either because their employers do not treat the island as their 'point of recruitment' or else because they prefer to live in town (and can afford to do so).

The 24 workers in our mainstream sample had worked on the Misima mine for an average of 11.8 years compared with an almost identical average of 11.9 years for the 13 workers in the control group. A few had been employed during the exploration and construction phases of the project, and one had been employed on rehabilitation of the mine site after the operation closed, but most had clearly been recruited in the early stages of the mining operation. Only four had been employed elsewhere before they started work on the mine. Most of the workers seem to have had some difficulty finding new jobs after they ceased their employment with Misima Mines or its contractors. This is not surprising, given that some were laid off before the mine finally closed in 2004 and PNG's resource boom did not pick up

steam until 2007. Even the 24 workers in our mainstream sample had to wait an average of 3.1 years before finding a new job, but had spent an average of 5.3 years in employment since they did so. Those in the control group were unemployed for an average of 4.7 years after losing their former jobs, and have been employed for an average of 3.8 years since finding new jobs. Given that they remained on the island, they would probably have been unemployed for even longer if it were not for the government's economic rehabilitation program.

A notable feature of the group as a whole was their low level of formal education. Only three had completed 12 years of secondary education (of whom two had university degrees); most had finished school at Grade 10 or a lower grade and then obtained a trade-related certificate after being recruited to work on the mine. None had obtained any additional qualifications since the mine closed. Few are likely to have entered the world of formal employment at all in the absence of the mine.

All but three of the 24 workers in the mainstream sample were earning between K800 and K1990 a fortnight, while all but one of the 13 workers in the control group were earning less than K800. The value of remittances supplied to other local households by local workers in the mainstream sample was somewhat lower than the value of remittances from workers in the rest of the national mainstream sample with comparable fortnightly pay rates. The mean value of their contributions in 2011 was K7275, while the median value was K4750. The value of inter-household transfers by workers in the control group was even lower: the mean value was K1647, while the median value was K700. This is understandable, given their lower levels of net income, but the figures are considerably lower than those for all national workers in the mainstream sample earning less than K800 a fortnight (K4727 and K2400 respectively). The difference may be due to the fact that these 13 workers were all living in their home villages, or else to the possibility that some of them were earning little more than the minimum wage (K200 a fortnight). On the other hand, four of these 13 workers said that the wages and benefits were what they most liked about their current job, while another four said that what they most liked was the contribution they were making to community development.

If our sample is representative of the larger group of former local mine workers who still have jobs in the formal sector of the economy, then the total value of their annual take-home pay would be somewhere between K5.5 million and K8.5 million, and the total value of their annual remittances to other households in the local economy would be somewhere between K1 million and K1.8 million. People on the island debate whether this represents more or less of a contribution to the local economy than the earnings of alluvial and artisanal miners, some of whom also worked on the large-scale mine when it was operating. We found a small group of artisanal hard-rock miners (all men) working on a site within the Special Mining Lease who were producing 20-30 grams of gold a day. At a local sale price of K65 per gram, their combined income would have been between K300,000 and K400,000 a year. Earnings from alluvial mining are much harder to calculate because the total number of miners is unknown, and many of them were only mining on a part-time basis. Most of them were individual men working on their own customary land, sometimes accompanied by their wives but rarely by their children because of the health risks associated with the work. Few of them were producing more than one or two grams per day. An individual or family who spent 100 days a year on this activity would be lucky to earn more than K10,000 a year from this activity, but this mean that 100 alluvial miners could still have a combined annual income of K1 million. Villagers living in the northern and western parts of

the island, at a greater distance from the site of the former large-scale mine, were less likely to engage in this activity, and were making some money from the sale of fresh food to other people on the island. We found no evidence of a return to the export of cocoa and copra, which had been the two main cash crops before the start of large-scale mining operations.

With the passage of time, the current cohort of workers from Misima who are still employed in the resource sector will leaved the workforce and are unlikely to be replaced by other workers from the island unless another large-scale mine is developed in the vicinity. One might imagine that the islanders would welcome this prospect, but there has in fact been strong local opposition to a proposal to develop a mechanized alluvial mining operation on the island. The Misima case seem to support the argument that local employment under the terms of the preferred area policy can mitigate the negative impact of mine closure, but it also suggests that this policy should not be seen as a substitute for the mine closure policy which the national government has been struggling to finalize for more than 10 years (Jackson 2002).

6 CONCLUSION: THE POSSIBILITIES OF POLICY

As we have seen, the recent resource boom (or commodity boom) in PNG has had mixture of positive and negative impacts on the labour market, on productivity, on livelihoods and on social cohesion. The number of Papua New Guineans directly and indirectly employed in the development of major resource projects has grown significantly over the last decade. Most of them believe that they have better jobs than their fellow citizens employed in other parts of the national economy, but this does not prevent them from seeking better jobs for themselves in a context of increasing labour mobility. There seem to be several factors behind this trend, and while it puts some upward pressure on wages and creates some headaches for many employers, it also means that jobs in the resource sector are less isolated from jobs in the rest of the economy. There has been considerable public debate about the negative effects of the resource boom on the quantity and quality of jobs available in other economic sectors, but this problem may be exaggerated in comparison with other symptoms of the Dutch Disease that are currently in evidence – especially the urban cost of living.

The scale and content of remittances made by workers in the resource sector job stream to relatives at home represents a significant contribution to social and economic well-being beyond the limits of major resource project enclaves. Workers formally employed in other sectors, including the public service, no doubt make similar contributions, but the evidence collected for this study indicates that the amount of remittances grows with the size of a worker's pay packet, so if workers in the resource sector are especially well paid, their contributions will be larger. The evidence collected for this study also indicates that town-based workers make bigger remittances to their rural relatives than those who live in villages and commute to work in major resource projects on a fly-in-fly-out basis. Whatever the reason for this, remittances from town-based workers can partly be understood as investments in a sort of social and economic safety net that makes it easier and more attractive for such workers to retreat to their home villages when they retire or if they lose their jobs. Even workers now based overseas are motivated to make this type of investment, but their emigration has a more significant impact in

creating new job opportunities in the domestic labour market and possibly contributing to an increase in the number of jobs available for women in the resource sector.

Evidence collected for this study also confirms the common observation that workers with higher levels of education and income are also more likely to marry partners from other ethnic groups or other provinces, and if they live in town, are more likely to associate with workmates or friends who are not members of the same ethnic group when engaging in social activities outside of the workplace. In this sense, people with good jobs or better paid jobs do make a positive contribution to national social cohesion, but to judge by the scale of their remittances, this does not appear to come at the expense of their links to the rural relatives of one or both of the partners. For understandable reasons, workers employed under the terms of the preferred area policy are less likely to form social relationships with people from other areas, and also make smaller remittances to relatives within the preferred area, partly because they tend to have a lower average income than other members of the national workforce in the resource sector.

The government policies that apply to the domestic distribution of benefits (including jobs) that flow from large-scale investment in the resource sector now have wider national application because of the sector's prominence in PNG's national economy. The benefit-sharing agreements associated with the preferred area policy are thus regarded as an integral feature of the political landscape, despite their distorting effects on the labour market and business activity. The benefit-sharing agreements associated with the LNG Project pose bigger questions about good governance than have previously been posed by any major resource project. However, national government policy makers have paid more attention to the question of who should get how much in the way of benefits from major resource projects than to the question of how these benefits might be translated into more and better jobs for the people of PNG. So how might this second question be addressed?

Let us first consider what the World Development Report calls the 'fundamentals' that constitute 'a precondition for strong job creation by the private sector' (World Bank 2012: 257). As we have seen, PNG's policy makers have recently assigned these to four main categories: land access, law and order, an enabling business environment, and public investment in economic infrastructure. The World Development Report treats economic infrastructure as part of the business enabling environment, combines property rights with the rule of law, and adds macroeconomic stability and human capital to the mix of fundamental factors (ibid.: 293-8). Given the extent of the PNG government's dependence on mineral revenues, we might treat the need for transparency in the management of these revenues as a factor in its own right. The government has in fact declared an interest in signing up to the Extractive Industries Transparency Initiative (GPNG 2012b: 97), but this in itself would not entail a commitment to greater transparency in the redistribution of such revenues under the preferred area policy.

The PNG government may yet struggle to maintain macroeconomic stability in the face of temptations to spend revenues from the LNG Project before it receives them (Batten 2013; Bulman 2013), but it has at least signaled an intention to moderate the future volatility of such revenues by establishing a Sovereign Wealth Fund (Duncan 2010; Basu et al. 2013). It has set remarkably ambitious targets for the number of new jobs that it expects to create by solving the country's law and order problems and the formalizing rights over customary land, but its strategies for achieving these goals do not give adequate

recognition to the difference between urban and rural areas. In particular, the government seems unwilling to recognize that a faster rate of urbanization could be good for productivity and living standards throughout the country if only it could focus on the urgent need to bring down the cost of urban land and housing. There is a parallel failure to deal with trade-offs between public investment in new economic infrastructure in urban as opposed to rural areas, with what appears to be an in-built preference for 'economic corridors' and 'impact projects' in rural areas so large that the economic benefits could be greatly diluted. And although the government appears to recognize the need to maintain or upgrade existing economic infrastructure before embarking on the construction of new facilities (GPNG 2012b: 113), history suggests that local politicians much prefer to open things that will make a big public impression for a short period of time. Whatever the mix of spending on rural infrastructure, history also suggests that it will not provide a quick-fix solution to the problem of rural poverty (Gibson and Olivia 2002).

There is a strong case to be made that the best way for the PNG government to apply its mineral revenues to all three forms of development which define the social value of a job is to spend them on the formation of human capital. The most recent national budget actually promises a 35 percent increase in funding for education and a 25 percent increase for health. Since that budget was delivered, the Prime Minister announced that the government would use some of this money to import hundreds of foreign doctors, teachers and nurses to fill vacancies in the public health and education systems. This stirred up a public debate about where these people might come from, why they were needed, and how much they would have to be paid by way of an incentive. The interesting point here is that the vacancies do not seem to have been created by the emigration of qualified personnel from PNG, as is known to occur in other developing countries, but by the unattractive terms and conditions of employment for national workers in both sectors. This raises important questions about the relationship between public sector pay scales, the lack of enthusiasm for manpower planning, and self-evident decline in the quality of technical and vocational education in PNG.

Although these questions are fundamental to an understanding of PNG's labour market, they also take us into the realm of more specific policies which governments may apply to the protection or creation of jobs once the economic fundamentals have been guaranteed. In the PNG case, the government's favoured method of creating more jobs outside the resource sector has been to adopt a mixture of subsidies and regulations to promote 'downstream processing' activities in other rural industries. However, these efforts have not proven to be very effective in achieving the economic diversification which resource-rich countries are meant to pursue. Indeed, these types of government intervention may simply add to the market distortions already being created by the preferred area policy.

It should be no surprise that there has recently been much debate in PNG about the tendency of a booming resource sector to suck highly qualified workers out of the public service, as well as other industries in the private sector. This is a trend that can certainly be detected in those government agencies responsible for regulating the resource sector itself. This raises the question whether public service salaries need to be increased in order to limit the scale of the brain drain. There is perhaps an argument for raising salaries in some critical branches of government, but this currently runs up against the provisions of the Public Finance Management Act, and these can only be avoided by turning line departments into statutory authorities which can offer better terms and conditions to their employees.

However, such measures do not address the main cost of living pressure which currently confronts all town-based workers, including public servants, which is the cost of housing. The government has not so far shown any enthusiasm for restoring the differential that used to exist between urban and rural minimum wages in order to cope with this problem, since a major increase in the urban minimum wage would probably lead to a further reduction in formal employment, if indeed it could be enforced on reluctant employers whose business costs have already risen substantially as an effect of the Dutch Disease.

In the resource sector itself, the government clearly has no interest in persuading the major resource companies to abandon the dual salary system, since the companies already have sufficient incentives to limit the employment of expensive foreign workers, and any increase in wages for national workers would only make the Dutch Disease make a turn for the worse. If anything, the government would do better to promote the emigration of highly skilled national workers from the resource sector in order to create more jobs for workers who remain behind. However, there is currently no government agency with either the mandate or the capacity to perform this task, and the workers in question have proven to be quite capable of organizing their own emigration, with or without the support of their former employers in PNG. Some employers might even prefer a system of incentives that would discourage the emigration of highly skilled national workers, but that is even less likely to be adopted as a matter of government policy.

Another thing the government should probably not do is to provide additional support to landowner companies based in resource project enclaves, beyond the support which they already receive from the application of the preferred area policy. While the application of this policy may have created the space for entrepreneurial LANCOs to emerge in the first place, their emergence from a much larger group of LANCOs with defective business models owes nothing to government support, and there is no reason to give them further competitive advantages against other nationally owned companies. Foreign investors in the resource sector now have a better idea of how to foster the emergence of such companies in their fields of operation, and there is an argument for such lessons to be shared, especially in the preparation of their mine closure plans. If there is a role for government here, it should mainly be concerned with policies to improve levels of corporate governance and accountability that would apply to all landowner companies.

The national government has been in the process of drafting a mine closure policy for the last 12 years, but it has yet to be finalized, and it is not clear what, if anything, it might eventually say about job creation or job protection. In this regard, the key to avoidance of social and economic dislocation in a preferred area appears to be twofold: first, an industrial training program that succeeds in creating a cohort of preferred area employees who are sufficiently skilled to gain employment in other parts of the country where they no longer count as preferred area employees; and second, the formation of at least one entrepreneurial LANCO which can also compete in a national marketplace, even if some of its staff are still recruited from the preferred area. In some areas, it may be possible for mining and petroleum companies to subsidize small-scale commercial activities that will provide a reasonable living for local people after project closure, but the record to date has not been impressive, and there is no reason to think that government policy measures would improve it.

This leaves us with three policy priorities which are already recognized to some extent, though not clearly distinguished from the many other things which the government aims to do to manage the impacts and benefits of the resource boom. First, as we have said already, skyrocketing rental costs in PNG's major urban centres, and especially in the national capital, are not simply a symptom of the Dutch Disease, but part of a longer term trend for the urban population to expand much faster than land can be freed up for the construction of new housing, even if the size of the urban population is increasing no more rapidly than that of the national population as a whole. Since this problem has been recognized for a long time, there is also a long history of government failure to deal with it effectively. But like other priority areas for government action, the problem will not go away, so some solution must be found.

A second priority should be to strengthen the public institutions of professional and technical training which currently have glaring weaknesses. This does not entail the reintroduction of centralized manpower planning of the kind attempted in the early years of Independence, nor does it entail a specific focus on the more specialized skills required by the resource sector. There is no point in having a surplus of qualified geologists when the resource boom comes to an end. On the other hand, it is unreasonable to expect that mining and petroleum companies should bear all the costs of making up for deficiencies in the public education of their national employees in a situation where workers trained at company expense are likely to find a new job with a new employer within a few years. There needs to be a concerted effort by relevant government agencies and organizations representing employers in different branches of industry to improve the overall quality of post-secondary education. This imperative has already been recognized by some aid agencies, but reliance on foreign aid to strengthen any part of the public education system is unlikely to produce sustainable results in the long term.

The third priority should be the development of human capital in those rural areas with the most acute levels of poverty, where the windfall benefits of a major resource project may never materialize, and where local people would struggle to take advantage of them even if they did. For the most part, these areas get no benefit from an increase in the quantity and quality of jobs in the formal sector of the economy because village children have an ever-diminishing chance of getting the sort of education that would qualify them for such jobs, and village adults do not even have the opportunity of migrating to a major town, getting jobs as security guards and receiving the minimum wage of K200 a fortnight. The question of what to do about these areas of extreme disadvantage has been recognized as a major policy problem for a long time, but here again, the recent tendency has been for the government to let foreign aid agencies search for a solution. The present national government might claim that it has come up with its own solution in the form of the free education policy that is now meant to relieve parents of the financial burden of school fee payments. However, free access to primary schools does not have much value if the schools have no teachers. There is a case to be made for special allowances to be paid to teachers and health workers who are posted to the least developed areas, so long as there is some sensible way of deciding where these areas are and limiting opportunities to abuse a system of financial incentives.

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