



# 2014 NATIONAL HUMAN DEVELOPMENT REPORT PAPUA NEW GUINEA

*From Wealth to Wellbeing:  
Translating Resource Revenue into Sustainable Human Development*





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# EXECUTIVE SUMMARY

Papua New Guinea (PNG) stands at a critical moment in its development. With Gross Domestic Product (GDP) growth of over 20 per cent expected for 2015, following the start of production from the massive PNG Liquefied Natural Gas (LNG) project, the country has a unique opportunity to leverage significant sustainable and equitable improvements in levels of health, education, income and other elements of inclusive human development. At the same time, the country also faces considerable risks. If poor choices are made, the impact of the high growth rates will be limited, even detrimental to the development prospects of Papua New Guineans and the nation and the lives of people living in poverty. This report aims to provide information and national as well as international case study experiences to assist decision-making in the country. The report has four purposes: (1) Review the extent to which Papua New Guinea's revenues from extractive industries have led to practical human development outcomes; (2) Reveal lessons from other countries that can be useful for Papua New Guinea; (3) Highlight some specific innovations from Papua New Guinea's experience that can contribute to development in other countries; and (4) Stimulate, inform and shift the debate in the country to enable leaders to make appropriate choices for the wellbeing of citizens.

Papua New Guinea's 40 year history of Independence has been dominated by the extractives sector. Large-scale mine and oil production (worth at least K150 billion since Independence) has driven formal sector growth, underpinned budgets that have improved health and education outcomes, as well as provided significant improvements in incomes and livelihoods for some. At the same time however, this production has sparked civil strife, caused massive environmental damage, arguably distorted the economy, and brought about a range of negative impacts on communities. Valuable lessons are being learnt (and have potential international relevance), but still the risk remains that the existing model of economic growth in the country will not deliver sustained improvements in wellbeing for the majority of the population.

The report reviews the state of human development in Papua New Guinea in terms of the three pillars of sustainable development – economic, social and environmental – and specifically examines the ways in which the extractive industries have contributed – positively and negatively – to these related but distinct pillars. While there have been some measurable achievements in terms of improvements in human development (increases in life expectancy, per capita income and educational achievement), many of the indicators are less positive. Despite 14 consecutive years of economic growth, there has been little change in poverty levels in the country. In fact the level of inequality in the country has increased.

There is much that is positive about the contribution of the extractives sector to Papua New Guinea's development, including significant revenue flows to government, cutting edge innovations to enhance revenue and transparency at the national level, as well as the involvement of some communities in some operational decision-making. There remains however, considerable scope for improvement. Other positive impacts include recent initiatives addressing service delivery, governance, and policy direction that provide useful guides to future action.

The report reviews the significant amount of national and international experience and recent policy development throughout the extractives sector, much of which has been driven by the realization that mineral and oil wealth has not always been a positive force for a country's national development. The term 'resource curse' captures the international view that growth based on a dominant extractives sector can, if not managed well, lead to a range of negative effects, including stunted economic growth, corruption, weak institutions, conflict, human rights abuses, and poor human development outcomes. There is also, however, experience that suggests the 'resource curse' is not inevitable: that there are particular political, institutional and economic mechanisms that can be used to better connect resource wealth with sustainable human development. Papua New Guinea is on the frontline of innovation in some of these areas, and valuable lessons can inform international best practice and decision-making.

Based on a review of the state of human development and the experience of the extractives sector in Papua New Guinea, along with case studies and lessons from the national and international experience, the report presents a range of policy options – framed around a United Nations Development Program's Strategy on Extractive Industries and Human Development. This aims to assist in better translating minerals and oil revenues into more sustainable and inclusive forms of human development. For this to happen, countries should seek to capture as much of the resource revenue as possible through transparent and accountable systems - without losing the foreign investment - and use this to boost human development through effective service delivery to the largely rural-based population, while working to reduce the negative social, economic and environmental impacts.

Policy options to do this include ways of making policy frameworks and operation-specific negotiations more effective and more inclusive, refinements in institutional governance and service delivery, improvements to transparency and management of revenue flows (though mechanisms such as the Sovereign Wealth Fund and the Extractive Industries Transparency Initiative), the establishment of a formal sector-specific grievance mechanism, a focus on building economic diversification into non-extractive sectors (especially agriculture and tourism), novel environmental management approaches, better integration of corporate community development contributions, and improvements in data collection and management processes.

Taken singularly, or preferably as a whole, these options provide the basis for enhancing the contribution of the sector to sustainable human development. They are offered as a basis for public and policy dialogue and debate, which should then form the basis for action. The report recognises that it is only the timely actions of stakeholders in the country – governments, leaders, politicians, non-governmental organisations (NGOs), development partners, citizens and the private sector – that will make a practical and real difference to human development outcomes in Papua New Guinea. Papua New Guinea has a unique window of opportunity to make some of these decisions now. The country needs to grasp this opportunity.



It is my pleasure to present to you the 2014 National Human Development Report (NHDR), 'From Wealth to Wellbeing: Translating Resource Revenues into Sustainable Human Development'. The first and so far only NHDR in Papua New Guinea dates back to 1998. Since then, the country has gone through enormous changes, vast opportunities

and complex challenges, lots of them linked to the realm of extractive industries.

I see four main purposes of this NHDR.

Firstly, it is timely in that it offers the opportunity for Papua New Guinea to reflect on the lessons of the past 40 years since Independence and to assess the contribution of the dominant resources sector on the economy, the nation and the development of its people. It therefore provides an up-to-date review of the current state of human development in our country on the back of a resource boom.

Secondly, the Report provides global experiences, lessons and tools that can inform debate and decision-making in Papua New Guinea for securing better development outcomes from resource extraction. United Nations Development Programme (UNDP), present in approximately 170 countries in the world, has been building experience and expertise in assisting resource rich nations to achieve better development outcomes from extractive industries, so it is well placed to share global experience in Papua New Guinea.

Thirdly, rather than only being the recipient of global experiences and lessons, the Report shows that several best practices have emerged out of the unique and complex cultural setup of Papua New Guinea. The Report serves as a promotional tool to assist Papua New Guinea's experience to be put on the frontline of innovation, informing global debate and decisions around these issues.

Lastly, this Report will help us stimulate, inform and shift the development debate in Papua New Guinea, closely following the thinking that has informed our National Strategy for Responsible Sustainable Development. The objective of the Papua New Guinea Vision 2050 to become a smart, wise, fair, and happy society, ranked in the top 50 in the UNDP's Human Development Index remains intact. This objective will be achieved by the creation of opportunities for personal and national advancement through sustainable economic growth, smart, innovative ideas, quality services and ensuring fair and equitable distribution of benefits in a safe and secure environment for all citizens. Our recent experience has clearly demonstrated that, if we want to successfully reach this goal, the path of relentless economic growth needs to be reviewed. The dominant global development paradigm based on economic growth, and its underlying values and belief systems, no longer serves our purpose or that of the planet. The appetite for consumption of

resources and drive for endless and high levels of growth in a context of high population growth and finite natural assets, results in on-going and often permanent damage to the unique social, cultural and environmental character that our country is blessed with.

Our Constitution points us to the 'Papua New Guinea way' of development, a reference to the country's unique cultures based on the sharing of wealth and community wellbeing equitably and sustainably, and asks us to put a renewed emphasis on responsible sustainable development. Responsible development means that individuals and communities do not undertake activities that compromise the world's biodiversity or put our children's future at risk. Sustainability requires responsible development. It should enable us to develop an economy that provides all the elements for wellbeing of our citizens in a manner that is self-perpetuating.

While the challenge will be to address the tensions and trade-offs between extractive industries, economic growth, social responsibility and environmental sustainability, it is clear that Papua New Guinea has a unique global opportunity to chart a new development path, one that speaks to the country's particular strengths of a unique environmental and cultural context, which provides the foundation for a future economy based on food and job security, tourism, medical research, green technology, and carbon credits, amongst others. Without taking appropriate actions now, our existing development pathway will remain shortsighted and could contribute to the erosion of the country's long-term assets, which are already undermined by symptoms such as high population growth rates, inequality, poverty and crime.

There is great urgency! We need to move out of this cycle before we find ourselves with a massive population with a huge appetite, eating into already depleting resources. This is difficult because we are challenged everyday by the primary and symptomatic issues of education, health, law and order, and keeping the economy steaming along to generate the revenues required to meet the country's growing needs.

If we manage to make this paradigm shift, Papua New Guinea will become a leader in a world looking for solutions, rather than an impoverished nation always playing catch-up. This National Human Development Report can help us achieve this. At the same time, the Report is only as good as the action and implementation that follows – by all of us. Ultimately, it is up to each one of us as citizens, to act responsibly and sustainably for the benefit of all of us, now and in the future.

Let me thank UNDP for its guidance and support for this Report, as well as all the individuals, groups and institutions that have contributed to the analysis and policy options. It is now over to all of us to act.

A handwritten signature in black ink, appearing to read 'Charles Abel'. The signature is fluid and cursive, written over a white background.

**Rt. Hon. Charles Abel, MP**

Minister for National Planning and Monitoring

# PREFACE | UNITED NATIONS DEVELOPMENT PROGRAMME IN PAPUA NEW GUINEA



Papua New Guinea next year will have one of the fastest-growing economies globally, with an expected growth rate of over 20 per cent. This soaring growth is driven largely by the extraction of natural resources, particularly minerals, gas and oil. It has turned PNG into a strong and stable economic performer in the Pacific region, cushioning it from the effect

of the global economic and financial crisis, which has significantly impacted on other countries in the region. This economic growth is fuelling many important new developments in the country. Papua New Guinea has graduated to 'Lower Middle Income' status and is increasingly assuming a regional leadership role in the Pacific. The national Government has formulated record budgets and made respective allocations for improved service delivery at the local level. The Government has advocated against corruption and sought to improve transparency and accountability. It is also playing an important role globally in shaping the post-2015 international development goals and work on 'Sustainable Development'. I commend the Government for these bold steps.

At the same time, the Government faces a variety of challenges to effectively deliver services to all of its citizens. Papua New Guinea is off-track and unlikely to meet any of the international (and few of the nationally tailored) Millennium Development Goals (MDGs) by 2015. The 2010 MDG Progress Report estimated that 40 per cent of the country's population lives on less than one dollar per day. With life expectancy of 61.6 years and 25 per cent of children not attending schools, the wellbeing of many Papua New Guinean citizens is under constant pressure. Women and girls in particular face greater disadvantage than their male counterparts. In the 2013 Global Human Development Index, Papua New Guinea ranks 156 out of 187 countries.

Papua New Guinea is witnessing a 'paradox of plenty', where the country's resource wealth is not translating into increased opportunities and capabilities for all Papua New Guineans, especially the large majority in the rural areas, and particularly vulnerable and marginalized segments of society, including women, children, elderly, youth, people suffering from long-term illnesses, and those living with disabilities. All Papua New Guineans, its leaders as much as 'ordinary citizens', need to assume greater responsibilities to make the wealth of the country work more effectively to improve the wellbeing of the people, by ensuring that revenues from resource extraction are used wisely to improve the quality of lives of all Papua New Guinea citizens. In this regard, the National Strategy for Responsible Sustainable Development, launched this year by the Hon. Minister for National Planning and Monitoring, provides an excellent roadmap for a paradigm shift that places the people of Papua New Guinea and their communities at the centre of development.

Papua New Guinea is not a recent entrant into 'resource dependence' and therefore has the advantage of being able to learn from its own

experiences as well as from other countries. This National Human Development Report seeks to focus on key choices and decisions that leaders need to make in the short and medium term to ensure that human development outcomes are maximised. The Report draws from a growing body of regional and global experience and policy advice that can assist decision makers in Papua New Guinea. The Report also aims to ensure that Papua New Guinea's experience of managing this shift contributes to and enriches global dialogue.

The Report aims to fulfil four purposes: (1) Review the extent to which Papua New Guinea's revenues from extractive industries have led to practical human development outcomes; (2) Reveal lessons from other countries that can be useful for Papua New Guinea; (3) Highlight some specific innovations from Papua New Guinea's experience that can contribute to development in other countries; and (4) Stimulate, inform and shift the debate in the country to enable leaders to make appropriate choices for the wellbeing of citizens.

Past experience in Papua New Guinea and elsewhere suggests that the improvements desired by the nation will require some tough decisions and a sustained focus on the part of leaders to achieve better outcomes. While the economic boom driven by the extractives sector provides a huge opportunity for the nation to significantly improve wellbeing and levels of human development for all citizens, this will not happen without some urgent and decisive actions being taken now. Repeating the mistakes of the previous boom, and not drawing on international lessons, would be a massive lost opportunity.

The future of Papua New Guinea is exciting. Making the right choices at this critical juncture will not only benefit more than seven million citizens, but also place the country in a pivotal role as a model for other developing states in the dynamic Asia-Pacific Region.

By drawing on global experience and expertise on how to avoid the 'resource curse' that has impeded MDG achievement and sustainable development in many nations, UNDP and the broader United Nations System in Papua New Guinea are uniquely placed to provide technical advice and strengthen the country's capacities. At the same time, the United Nations can help make innovative and often locally grown initiatives known to the world and share Papua New Guinea's unique experience in this area.

Reports like these are only as good as the actions that follow. I therefore look forward to the policy debates and decisions around these issues, and can assure Papua New Guinea that the United Nations stands ready to serve the country and all its citizens in meeting the development aspirations of the nation in an equitable and sustainable manner.

A handwritten signature in black ink, appearing to read 'R Trivedy', with a long horizontal stroke extending to the right.

**Roy Trivedy**  
UNDP Resident Representative  
UN Resident Coordinator

# THE PAPUA NEW GUINEA NATIONAL HUMAN DEVELOPMENT REPORT 2014 PROCESS

The first Global Human Development Report was published in 1990 and opened with the simply stated premise that has guided all subsequent Reports: 'People are the real wealth of a nation.' By backing up this assertion with an abundance of empirical data and a new way of thinking about and measuring development, the Human Development Report has had a profound impact on policies around the world.

The National Human Development Reports (NHDRs) bring this message to life, duly reflecting specific country contexts, priorities and aspirations. They place solid analysis, from the perspective of people-centred development, at the forefront of the national agendas, and they shape policies and programmes by providing options on a pertinent theme. NHDRs have been growing into an extraordinary country-level movement for global change. From the bottom-up, they are breaking down the global targets for poverty reduction and human development into national benchmarks and action plans that enjoy increasing political attention, debate and mobilization. NHDRs present independent and objective analysis, statistics and other relevant data, applying the human development perspective to priority national concerns, emerging challenges and visions. Their relevance depends on six principles:

- National ownership
- Independence of analysis
- Quality of analysis
- Participatory and inclusive preparation
- Flexibility and creativity in presentation
- Sustained follow-up.

In the case of this Report for Papua New Guinea, UNDP's support to the Government started in 2011, when UNDP facilitated the participation of a high-level Government delegation to the UNDP Regional Symposium on Extractive Industries and Human Development held in Mongolia. It was at this conference that the then Government requested UNDP to undertake the research for a NHDR on the same topic. This request was renewed by the O'Neill-Dion Government at the Pacific Symposium on Extractive Industries and Human Development held in Fiji in 2013. At that conference, the Ministry for Mining indicated that PNG was prepared to host the third regional conference in the series.

An NHDR Steering Committee was established and provided overall guidance to the structure and content of the report and ensured the process is consultative. This committee as well as the consultative process that followed included and sought inputs from representatives from Government Departments, Authorities and Offices, industry, civil society, and development partners. The participation in these consultations was remarkable and many partners indicated how timely and useful such a Report might be,

not only to government, but also to the general public.

The Report was also informed by the 2013 consultations that were held with grassroots and marginalized population groups to determine their development priorities in achieving "the future we want", and to help the Government develop its Post-2015 Development Agenda Country Report. Good governance and service delivery turned out to be the top priorities, including greater transparency and accountability in the management of the country's resources.

Lastly, two multi-stakeholder fora organized in partnership with the Consultative Implementation and Monitoring Council (CIMC) allowed representatives from public, private, civil society and development partner sectors to discuss the findings and policy options of the Report. During the entire process, there was also significant input from UNDP regional and headquarter units and other UNDP Country Offices, as well as Papua New Guinea-based UN agencies.

Throughout the research and formulation process, great emphasis was placed on data collection – both directly from government and through the UN and other agencies. Early in the process it became clear that while sub-national data in particular was identified as a critical, the results of the 2011 National Census were unlikely to be available to be included in the NHDR analysis. Great efforts were therefore made to undertake data gathering and analysis from other recent surveys and other available official data, with Census data integrated over the last weeks of Report formulation.

Ideally, a Human Development Report includes the presentation and analysis of the country's Human Development Index (HDI), illustrating its state of development. It was the intention from the start to map provincial and district levels of resource extraction against the HDI at the same levels. Given that the sub-national analysis of the Census was not available at the point of finalizing the Report, this exercise will be taken forward as a follow-up to the Report. The reader should be aware that overall, data availability, quality and coherence were a big challenge. The Report tried to reconcile this, but may not have resolved it entirely. Despite this caveat, the analysis and policy options are very well founded.

This participatory process helped ensure high quality information, analysis and levels of national ownership. The Report wants to acknowledge the leadership, participation, contributions and support received by:

- Department of Prime Minister and National Executive Council
- Department of National Planning and Monitoring
- Department of Finance
- Department of Treasury



- Department of Environment and Conservation
- Department for Community Development, Religion and Youth
- Department of Mineral Policy and Geohazard Management
- Mineral Resources Authority
- National Statistics Office (NSO)
- National Fisheries Authority
- Papua New Guinea Forest Authority
- Consultative Implementation and Monitoring Council (CIMC)
- PNG Chamber of Mines and Petroleum
- Transparency International Papua New Guinea
- Institute of National Affairs
- The Center for Environmental Law and Community Rights (CELCOR)
- Barrick Gold
- Exxon Mobil
- Nautilus Minerals (PNG)
- Newcrest Mining Limited
- Ok Tedi Mining Limited (OTML)
- Oil Search Limited
- World Bank Papua New Guinea
- Asian Development Bank
- New Zealand Aid programme
- Australian Department for Foreign Affairs and Trade (DFAT)
- European Union
- Japan International Cooperation Agency (JICA)
- UN Agencies in Papua New Guinea
- UNDP Pacific Center
- Asia Pacific Regional Center
- International Center for Human Development
- Oslo Governance Center
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#### WITH A SPECIAL MENTION TO:

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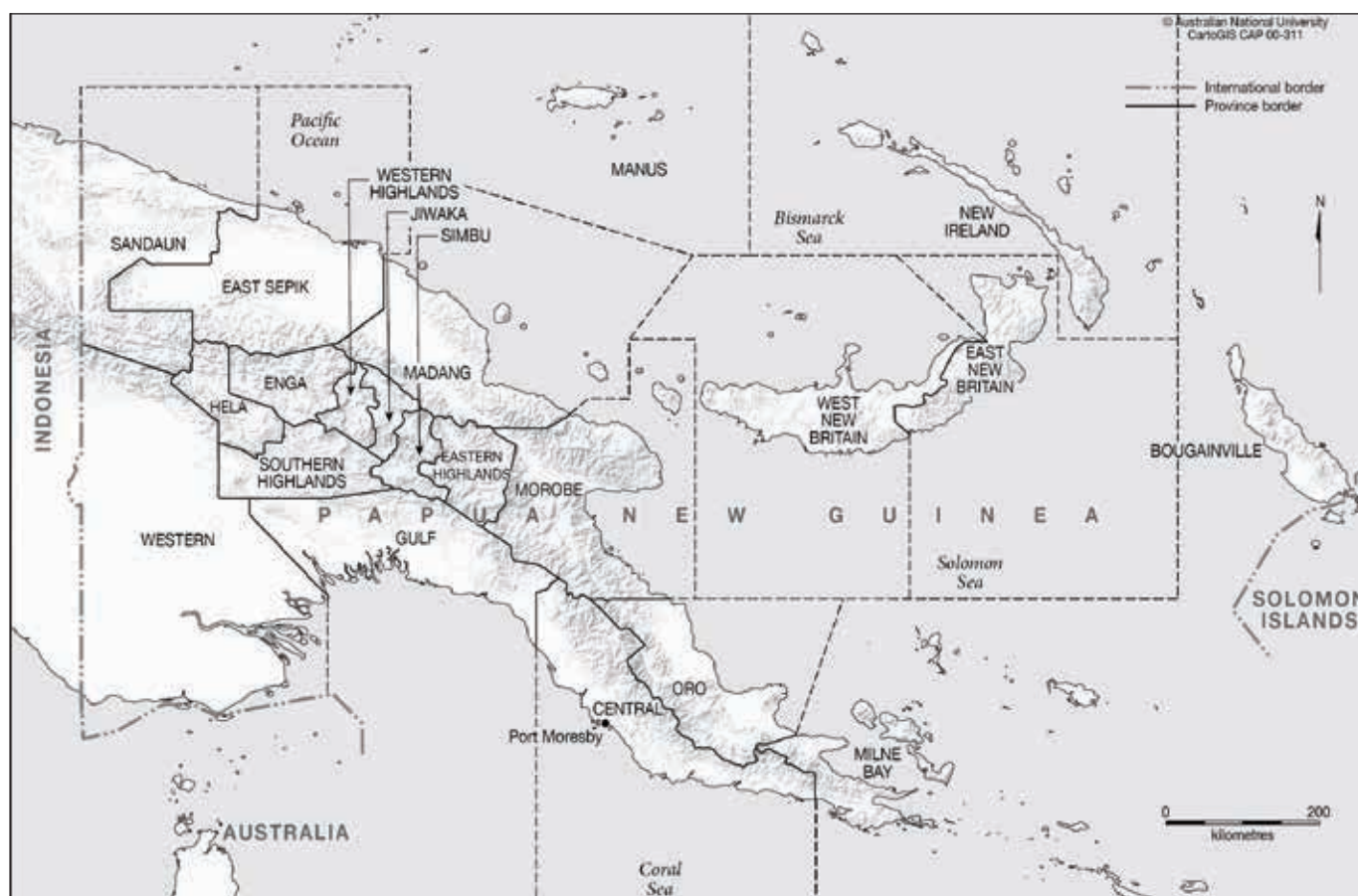
ABG	Autonomous Bougainville Government
ADB	Asian Development Bank
AFBA	Annual Funding Budget Amount
AIDS	Acquired Immune Deficiency Syndrome
ANC	Ante Natal care
ANU	Australia National University
APT	Additional Profits Tax
ARB	Autonomous Region of Bougainville
ART	Antiretroviral Treatment
ASM	Alluvial and Small-scale Mining
BCL	Bougainville Copper Limited
BNPL	Basic Needs Poverty Line
BPNG	Bank of Papua New Guinea
BRA	Bougainville Revolutionary Army
BSAs	Benefit Sharing Agreements
CAO	Compliance Advisory Ombudsmen
CCD	Corporate Community Development
CORFO	Corporación de Fomento de la Producción
CEDAW	Convention on the Elimination of All Forms Of Discrimination Against Women
CEPA	Conservation and Environment Protection Authority
CHWs	Community Health Workers
CIMC	Consultative Implementation and Monitoring Council
CMCAs	Community Mine Continuation Agreements
CRC	Convention on the Rights of Children
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
CSRM	Centre for Social Responsibility in Mining
DEC	Department of Environment and Conservation
DHS	Demographic and Health Survey
DMPGM	Department of Mineral Policy and Geohazard Management
DPE	Department of Petroleum and Energy
DSIP	District Services Improvement Program
DSP	Development Strategic Plan
DSTP	Deep Sea Tailings Placement
EDD	Expected Date of Delivery
EEZ	Exclusive Economic Zones
EHL	Esso Highlands Limited
EIAs	Environmental Impact Assessments
EITI	Extractive Industries Transparency Initiative
EL	Exploration Leases
EMPNG	ExxonMobil PNG
EPG	Enga Provincial Government
FESS	Fund for Economic and Social Stabilisation
FIFO	Fly-in-Fly-out
FPIC	Free Prior Informed Consent
GAVI	Global Alliance for Vaccines and Immunization
GBV	Gender – Based Violence
GDP	Gross Domestic Product
GFATM	Global Fund
GFC	Global Financial Crisis

GGHE	General Government Health Expenditure
GNP	Gross National Product
GNPC	Ghana National Petroleum Corporation
GPF	Ghana Petroleum Funds
HDI	Human Development Index
HDR	Human Development Report
HIES	Household Income and Expenditure Survey
HIV	Human Immunodeficiency Virus
IAIA	International Association of Impact Assessment
ICMM	International Council on Metals and Minerals
IFC	International Finance Corporation
IMF	International Monetary Fund
IMR	Institute of Medical Research
IRC	Internal Revenue Commission
ISLP	International Senior Lawyers Project
ITT	Tambococha Tiputini Trust Fund
ITTO	International Tropical Timber Organization
LLG	Local Level Government
LLGSIP	Local Level Government Services Improvement Program
LMC	Lihir Medical Centre
LMIC	Lower Middle Income Country
LNG	Liquefied Natural Gas
LSDP	Lihir Sustainable Development Plan
MAC	Mining Advisory Council
MCC	Chinese Metallurgical Construction Group
MCH	Maternal Child Health
MDCs	Mine Development Contracts
MDGs	Millennium Development Goals
MIC	Metal Industries Company
MIGA	Multilateral Investment Guarantee Agency
ML	Mining Lease
MMR	Maternal Mortality Rate
MoA	Memorandum Of Agreement
MPs	Members of Parliament
MPTF	Multi-Partner Trust Fund Office
MRA	Mineral Resources Authority
MRDC	Mineral Resources Development Corporation
MRSF	Mineral Resources Stabilisation Fund
MTDP	Medium Term Development Plan
MTDS	Medium Term Development Strategy
NACS	National AIDS Council Secretariat
NCD	National Capital District
NCDR	New Case Detection Rate
NCS	National Catering Services
NDoH	National Department of Health
NEFC	National Economic and Fiscal Commission
NESC	National Energy Skills Programme
NFHSDP	North Fly Health Services Development program
NGC	National Gas Company
NGO	Non-Government Organisation
NRI	National Research Institute
NSRSD	National Strategy for Responsible and Sustainable Development
OCCD	Office of Climate Change and Development

ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OECD-DAC	Organisation for Economic Co-operation and Development – Development Assistance Committee
OLPLLG	Organic Law on Provincial and Local Level Government
OTML	Ok Tedi Mining Limited
PDWA	Porgera District Women’s Association
PIC	Pacific Island Country
PIMI	PNG Industry Malaria Initiative
PJV	Porgera Joint Venture
PNG	Papua New Guinea
PNG LNG	Papua New Guinea Liquefied Natural Gas
PNGCMP	Papua New Guinea Chamber of Mining and Petroleum
PNGIMR	Papua New Guinea Institute of Medical Research
PNGFA	Papua New Guinea Forest Authority
PNGSDP	Papua New Guinea Sustainable Development Program
PPL	Petroleum Production Licence
PPP	Purchasing Power Parity
PRF	Pension Reserve Fund
PRMA	Petroleum Revenue Management Act
PSIP	Provincial Services Improvement Program
RBM	Results-Based Management
SAMS	Scottish Association of Marine Science
SDGs	Sustainable Development Goals
SHD	Sustainable Human Development
SIAs	Social Impact Assessments
SIP	Services Improvement Programme
SMART	Specific, Measurable, Achievable, Relevant and Transparent or ‘Time-bound’
SME	Small and Medium Enterprise
SML	Special Mining Lease
SSG	Special Support Grant
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
SWF	Sovereign Wealth Fund
TAC	Total Allowable Catch
TB	Tuberculosis
TCS	Tax Credit Scheme
THE	Total Health Expenditure
TLPs	Training and Localisation Plans
UBSA	Umbrella Benefit Sharing Agreement
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNICEF	United Nations Children’s Fund
UNREDD+	United Nations Reduced Emissions from Deforestation and forest Degradation, Plus conservation, carbon stock enhancement and sustainable forest management
US	United States
USD	United States Dollar
UTT	University of Trinidad and Tobago
UWI	University of the West Indies
WWF	World Wide Fund
Yasuni-ITT	Yasuni Ishpingo Tambococha Tiputini Trust Fund

## Papua New Guinea | Basic Context and Human Development Status

Land Area	461, 937 km <sup>2</sup> (2011 NFA)
Marine Jurisdiction	3.1 million km <sup>2</sup>
Population	7.254 million (2011 Census)
Population Growth Rate	3.15% (2011 Census)
Income Level	Lower Middle Income (2013 World Bank)
Human Development Index	0.491 (2013), PNG was ranked 157 out of 187 countries (2014 HDR)
GDP (current USD\$)	\$15.29 billion (2013 World Bank)
GDP Growth Rate 2013	5.1% (GoPNG Budget 2014)
Structure of the economy (Sectoral composition of GDP)	Primary Industry (31%), Extractive Industries (18%), Construction (16%), Manufacturing (8%), Services (27%) (ADB 2012)
Composition of exports	Gold: 40%, Copper: 11%, Crude Petroleum: 15%, Nickel/ Cobalt: 4% (BPNG 2014)
GDP/Capita	USD\$2,852 for 2013 (UNDP 2014)
Poverty (Basic Needs Poverty)	39.9% (HIES 2009/10)
Employment (formal sector)	61.6% (HIES, 2009/10)
Infant Mortality Rate	58/1,000 (2006 DHS also cited in 2011 Census)
Maternal Mortality Rate	733/100,000 (2006 DHS also cited in 2011 Census)
HIV/AIDS Prevalence Rate	0.7% (2013 UNAIDS)
Gender Inequality Index	0.617 – ranked 133 out of 149 countries (2014 HDR)
Women in Parliament	3 (increased from 1 in 2011 general elections)
Primary enrolment rate	50.9% (net)(HIES 2009/10)
Secondary enrolment rate	28.1% (net) (HIES 2009/10)
Access to potable water supply	25.8% (HIES 2009/10)
Forest cover	79%
Forest cover change	15% due to logging and agriculture purposes (2013 SNC Report)





# CHAPTER 1

## Introduction: Natural Resource Wealth and Human Development

### 1.1 INTRODUCTION

The extractive industries<sup>1</sup> occupy a dominant position in the political and economic landscape of Papua New Guinea. This will be further extended with the recent commissioning of the US\$20billion PNG LNG project. On the back of this project, GDP growth for 2015 is projected to increase to more than 20 per cent (Asian Development Bank (ADB) 2014). While this provides an opportunity to improve the living standards and opportunities for the population of over 7 million, Papua New Guinea has been here before. In the early 1990s another resources boom (oil and gold) pushed GDP growth to almost 20 per cent, and yet the following years were a 'lost decade' with stagnating levels of human development for the bulk of the population.

Papua New Guinea stands at an important juncture in its development. The country has a unique opportunity to leverage significant sustainable and equitable improvements in levels of health, education, income and other elements of broad-based development on the back of its current and projected economic growth rates. The country also faces considerable risks. If poor choices are made, the impact of the high growth rates will be limited, even detrimental to the development prospects of the nation.

*Papua New Guinea stands at an important juncture in its development. The country has a unique opportunity to leverage significant sustainable human development, but also faces considerable risks.*

This report aims to provide information and case study experiences to assist decision-making in the country. This introductory chapter sets out the broad development experience and context of Papua New Guinea, highlighting the continuity of extractive industries in its history. Then, the concept of Human Development and its relationship to sustainable development is introduced, before a brief outline of the structure of the report wraps up this section.

### 1.2 PAPUA NEW GUINEA'S CONTEXT AND DEVELOPMENT EXPERIENCE

Human settlement in Papua New Guinea dates back several

millennia, but it was only in recent history that the country has been in contact with outsiders. Papua New Guinea's colonial and post-colonial history is closely tied to the extraction of mineral wealth. Permanent European presence occurred from the late nineteenth century, with much of the early European exploration driven by gold prospectors, pre-empting a government presence in many parts of the country. In the 1960s the mineral discoveries at Panguna on Bougainville Island (then North Solomons Province) and Ok Tedi in Western Province introduced large-scale mining to the country. When Panguna entered production shortly before Independence from Australia in 1975, it represented the only major industrial development in the country. Since then mining, oil, and gas (and to a lesser extent forestry and fisheries<sup>2</sup>) have been a dominant influence on the economy and the lives of Papua New Guineans. In the short and medium term, this will not change, and the nation's future will continue to be shaped by current resource policies and practices.

While these resources have underpinned the nation's growth and development experience, there is a widespread perception within the country **that this extractive-based form of development has not been inclusive or reached as many Papua New Guineans as it could and should have**. While some indicators of developmental progress have shown significant signs of progress in the past 38 years – for example life expectancy has increased by more than 10 years since 1980, and the average years of schooling has more than tripled over the same period (UNDP 2014) – Papua New Guinea's progress has not been as rapid as many other similarly endowed developing countries.

Getting services to all citizens is a very challenging task. Papua New Guinea is one of the world's most diverse, most dispersed and most rural nations, with many remote and inaccessible communities. It has an extremely varied set of landscapes and environments spread over more than 600 islands. Of its more than 7 million people most (80 per cent) live in rural areas, speak almost 12 per cent of the world's languages<sup>3</sup>, and culturally belong to more than 800 distinct groups with different belief systems, languages, material culture and forms of social organization. This human and physical diversity causes poor accessibility, high costs of logistics, and supply management difficulties. These are challenges faced by government, development partners, private sector, civil society organizations and all Papua New Guineans alike.

The country is shaped by these challenges. Politically, Papua New Guinea has a multi-party Westminster style of democracy, with

<sup>1</sup> In this report, the term 'extractive industries' refers to the mining and petroleum industries reliant on sub-surface mineral resources (including hard-rock mining, oil and gas production). The term is used interchangeably with 'extractives' or 'extractive sector'. Reference to natural resources refers here to these mineral resources as well as forest and marine resources.

<sup>2</sup> While the focus of this report is Papua New Guinea's mineral resources, the country also has considerable stocks of renewable resources, particularly forestry and fisheries (see Appendix 1). While these resources are very different in many ways from mineral resources, there are also many parallels in terms of both strategic level policy and operational best practice guidelines (such as around community consultation and participation).

<sup>3</sup> Ethnologue: Languages of the World (15th ed.). <http://archive.ethnologue.com/15/web.asp>

fluidity in the make-up of parties and parliamentary allegiances. Administratively, the country seeks to address these challenges through a high level of decentralization, i.e. 22 provinces, 89 districts, 313 Local Level Governments (LLGs) and 6131 Wards. The recent trend has been towards increased financial devolution to provincial, district and local levels of government. Notwithstanding this, central government policy making and fiscal control remains strong, although implementation and service delivery is limited by weak capacity among both line government agencies and the sub-national government service providers. This has led to inefficiencies in the public service, including corruption. In 2013, the former Anti-Corruption Taskforce Sweep claimed that 40 per cent of the government's development budget had been misused or was unaccounted for.

Papua New Guinea receives considerable support from its development partners to address these challenges. Papua New Guinea is currently a net aid recipient. Australia is its largest bilateral donor, and together with significant multilateral donors, contributed a total of US\$3.2billion in Official Development Assistance (ODA) in 2011. In that year, these ODA Grants comprised a third (33.9 per cent) of the total Development budget, and made up around 16 per cent of total government spending (Development Finance and Aid Assessment Report, 2013). However, having graduated to Lower Middle Income Country (LMIC) in 2008 Papua New Guinea has reduced its aid dependence from 13.3 per cent of the total government budget in 1990 to 8.3 per cent in 2000, and 5.5 per cent in 2010 (Development Finance and Aid Assessment Report, 2013). With increasing income from extractive industries and other sources, this percentage is likely to decline further in the coming years. As a result, Papua New Guinea has worked to reframe the nature of its relationship with donors – in particular Australia – into a more equal form of regional partnership. As the largest Pacific Island Country (PIC), Papua New Guinea is also increasingly playing a regional leadership role. This is illustrated by the Government's plans to set up a Regional Economic Development Fund, in order to support other PICs on issues with which the Government has in the past provided ad hoc assistance, including climate change adaptation, disaster relief, and support for electoral processes. This maturation of Papua New Guinea in the recent past can largely be linked to additional resources from extractive industries becoming available now and in the near future.

**The extractives sector has produced innovative and distinctly Papua New Guinean responses to some of the successes and**

**failures of operations.** For example, the Development Forum concept introduced in 1989 and more recent Benefit Sharing Agreements (BSAs) were at the leading edge of innovation in the sector. There is also a history of successive national governments successfully engaging with multinational mining companies over the distribution of revenue from the minerals sector – from the 1974 renegotiation of the Bougainville Copper Agreement and the 1992 renegotiation of the equity shares in the Porgera gold mine, to more recent debates over the ownership of the Ok Tedi mine.

*“Papua New Guinea is a resourceful Country and with the implementation of the Liquefied Natural Gas (LNG) Project which will produce the first gas project in 2014. I believe that from this there will be a lot of income generated therefore I want every Papua New Guinean including the rural people to benefit from this. I want my country to be developed in the future”*

KIMROSE UVE, 17 YEARS OLD

At the same time, the exploitation of natural resources in the country has generated conflict and controversy. Public debate around the share of returns to the country or specific provinces is commonly played out in the press, and conflicts exist around many of the extractive operations. For example, and most significantly, the 1989 closure of the Bougainville mine following local resistance to its social and environmental effects sparked a violent conflict between Bougainvilleans and the Papua New Guinea state that claimed up to 10,000 lives – the most costly conflict in the Pacific since the Second World War. Another example is the environmental devastation caused by the Ok Tedi mine which led to a high profile and highly contested law suit in Australia in the mid-1990s. Lower-level disputes and conflicts – around human rights abuses, compensation and environmental issues, among



<sup>4</sup> Outside the extractives sector there are also regular disputes and concerns over unsustainable and destructive forestry operations, 'land grabs', and the over exploitation of lucrative fisheries by foreign vessels.

*The effects of Papua New Guinea's 40 years of mineral resource dependence are ambiguous, contested and run deep.*

others – arise regularly at the various operations.<sup>4</sup>

The effects of Papua New Guinea's 40 years of mineral resource dependence then are ambiguous, contested and run deep, and the debates around these form the focus of this report. The extractives sector in Papua New Guinea has created challenges that are consistent with many of the features of the so-called 'resource curse', discussed in the following chapter. There has been limited diversification away from mineral dependence since Independence, and literature suggests that a high dependence on resources often contributes to reducing government capacity, rising corruption, increased conflict, inequality and structural poverty, all of which have occurred in Papua New Guinea.

In Papua New Guinea's case poverty<sup>5</sup> levels do not appear to have changed significantly since 1996 despite an economy that has grown at almost 6.5 per cent per annum over the past decade. Perhaps most telling are the poor levels of human development in Papua New Guinea despite the obvious resource wealth of the country. In 2013, Papua New Guinea had a Human Development Index (HDI) of 0.491, placing the country in the 'low human development' category, ranked 157 out of 187 nations. Papua New Guinea's relative ranking has improved slightly since the first calculation of the measure in 1980 (when it was ranked 110/124)<sup>6</sup>. If ranked by education and health components of the HDI measurements alone (Papua New Guinea's Gross National Income (GNI) per capita of \$2,453 (in 2005 PPP \$) is relatively high for low HDI status countries), the country would be ranked 15 places lower, indicating that outside of economic growth, development outcomes have been poor.

Papua New Guinea will not meet any of the universal Millennium Development Goals (MDGs) by 2015, and even most of the nationally-adjusted goals are unlikely to be met (MDG Update 2010) by this time:

'[T]he global and national MDG targets remain difficult to achieve.

The reasons for this are varied and include poor baseline information, weak implementation capacity and targets not being monitored and evaluated periodically.<sup>7</sup>

Of particular note are the very poor indicators relating to gender disparity and inequality, with women in Papua New Guinea having consistently lower education and health indicators, and being subject to high levels of gender-based violence. The most recent 'scorecard' on Papua New Guinea's progress against the MDGs is reproduced in Appendix 5.

Four factors help account for the poor developmental outcomes:

- 1) The relatively recent nature of exposure to the cash economy and to modern health and education systems in most parts of the country, which means the starting point for health and education levels was very low to begin with;
- 2) The dispersed nature of the population among the diverse, fragmented and rugged landscapes of the country which has made the extension and delivery of government services difficult;
- 3) The resource-driven growth in Papua New Guinea over the past four decades has not required large-scale mobilization of the labour-force or land (as for example, commercial agriculture or manufacturing does), or new technologies, and neither has it generated the development of a large consumer base for its products. Hence there has been no imperative – from government or from the private sector – to reach out to the various dispersed remote rural communities (Baxter 2001, Datt and Walker 2006);
- 4) Sub-national governance and government capacity remains limited in many areas. This is an important theme that impacts centrally on many of the social, environmental and economic issues and linkages, and is explored in more depth below.

<sup>5</sup> The term 'poverty' is contested in Papua New Guinea policy circles (as discussed further in Chapter 4), as the abject poverty found elsewhere in the world is largely absent, or masked by people's on-going connections to land and subsistence food production. However income poverty and poverty of opportunity are acknowledged as widespread in both rural and urban settings.

<sup>6</sup> The HDI figures and rankings are not directly comparable across the reports due to regular updates in the methods used and the changing number of countries for which the HDI are calculated.

<sup>7</sup> The PNG Government (GoPNG) in 2004 localised the MDGs under its 2005 – 2010 Medium Term Development Strategy, providing the Government with targets that were aligned to Papua New Guinea's development strategies. Further revisions were made in 2010 globally and as such a second localised exercise was executed, producing 22 localized targets and 90 indicators. The Post-2015 Development Agenda report (GoPNG 2013) notes that the localisation process allowed for adjusted perceptions of what Papua New Guinea understood as development: For example, for Goal 1 on Poverty Alleviation, the target of reducing '...by half the proportion of people whose income is less than \$1 a day' was considered irrelevant. Rather, it was felt, the focus should be on reducing poverty of opportunity. This classification has allowed policy makers to target five areas: poverty of employment, poverty in food security and nutrition, poverty in education and literacy, poverty in longevity and poverty in household facilities." (GoPNG 2013).

Together these factors have meant the slow spread of economic benefits, health services and education systems into many rural parts of Papua New Guinea, with the result that improvements in the human development indicators over the past 40 years have been slow.

The impending revenue flows from the massive PNG LNG project (and other proposed resource projects, including sea-bed mining) provide a clear reason to consider how the wealth from these developments can be better translated into more inclusive and sustainable improvements in human development. Recent and

*We will be ranked in the top 50 in the United Nations Human Development Index by 2050, creating opportunities for personal and national advancement, through economic growth, smart innovative ideas, quality service and ensuring fair and equitable distribution of benefits in a safe and secure environment for all citizens.'*  
(GoPNG 2011)

on-going medium- and long-term planning processes (including a National Strategy on Responsible and Sustainable Development) have devised an ambitious development agenda, direction and set of priorities for Papua New Guinea (see Box 1.1). There are also new policy innovations, including a Sovereign Wealth Fund

(SWF), application to join the Extractive Industries Transparency Initiative (EITI) and a proposed new Mining Act. In addition are the endeavours of government and donors to improve capacity and effectiveness of sub-national government. These combined efforts enable significant opportunities on which to build a more transformative and focused approach to human development.

### 1.3 WHAT IS 'SUSTAINABLE HUMAN DEVELOPMENT'?

UNDP defines Human Development as 'broad based progress that raises standards and expands people's choices in all countries and communities in all key dimensions of human development, from health and education and livelihoods to the personal freedom to control and improve one's own life' (2013 HDR, page 11). Human Development in such terms is clearly not simply about economic growth, and neither is it merely health and education service delivery. Instead it places people at the centre of development, and seeks to enlarge people's choices by building their capabilities,

*"The mine and gas fields must be preserved for future generations"*

EZEKIEL KERUA, 18 YEARS OLD

allowing them to expand the range of things that they can do or be (Sen 1992).

The most widely used indicator of Human Development is the Human Development Index (HDI)<sup>8</sup> (Box 1.2). The 2010 global Human Development Report introduced a range of new related

## BOX 1.1: HD AND HDI

While the HDI is a useful tool for global comparisons of human development and progress, it does not capture a range of other important facets of human development such as inequality, governance, rights or participation. 'Not surprisingly, the HDI, which proved very popular in public discussion, has a crudeness that is somewhat similar to that of Gross National Product (GNP). The crude HDI did what it was expected to do: work as a simple measure like GNP but, unlike GNP, without being oblivious of everything other than incomes and commodities. However the huge breadth of the human development approach must not be confused, as it sometimes is, with the slender limits of the HDI', Amartya Sen in the introduction to the 2010 Human Development Report (UNDP 2010).

<sup>8</sup> Introduced in the 1990 UNDP Global Human Development Report, the HDI is an indicator made up of three components that provide a simple measure of income, health and education levels in a country. The calculation of the HDI changed in 2010. Until 2009 it had been calculated as an arithmetic mean of three indices: GDP per capita, a life expectancy index, and an education index (based on school gross enrolment ratios and adult literacy). In the 2010 Global Human Development Index a new method was introduced based on the geometric mean of Gross National Income (GNI) per capita, the life expectancy index, and a new education index. This new education index takes into account the expected years of schooling a child entering school age today can attain and the average number of years of schooling for adults. Under the old method of calculating HDI using the arithmetic mean, advances in one component can compensate for shortcomings in another component. Thus individual components were perfectly substitutable for one another. With the new approach using the geometric mean, this is no longer the case, so that 'poor performance in any dimension is now directly reflected in the HDI... This method captures how well rounded a country's performance is across the three dimensions' (UNDP 2010:15).

<sup>9</sup> These again reflect concerns with social equity and inequality in development, along with broader understandings of the ways in which people's freedoms are constrained by poverty of access as much as poverty of income (UNDP, 2010).

Human Development is closely linked to the concept of sustainable development. The World Commission on Environment and Development (1987) defined sustainable development as 'development that meets the needs of the present generation without compromising the ability of future generations to manage their needs'.

have produced the notion of sustainable human development (SHD). As the complexity of these concepts grows, so too does the awareness of the interdependence of the different 'pillars' of sustainable development, the need to seek possibilities for mutual reinforcement between them, and new ways of supporting decision-making when trade-offs between them are necessary.

## BOX 1.2: THE MEANING OF SUSTAINABLE DEVELOPMENT IN THE PAPUA NEW GUINEA CONTEXT

It is important in any country-specific discussion of global terms such as sustainable development to be aware of the different ways in which the term may be understood by different groups within the country. In the Papua New Guinea context, many of the principles of Sustainable Development have been apparent in the constitutional and planning framework from Independence, and continue to shape the direction of current planning documents and policy positions, such as the 2014 National Strategy on Responsible and Sustainable Development. In this document Sustainable Development is defined as a form of Responsible Development, and 'means we develop an economy that provides all the elements for the wellbeing of our citizens in a manner that is self-perpetuating'.

Outside of these formal settings, it is clear also that many of the traditional, rural-based communities have practiced forms of subsistence agriculture and hunting and fishing that exhibited a high degree of sustainability, and indeed are often held up as models for more sustainable forms of living for other parts of the world (see Jared Diamond's 2012 best-selling book, *The World Until Yesterday*). At the same time, contemporary pressures – population growth and a growing desire and need for access to cash – are driving practices in some places, putting unsustainable pressures on local resources. In the 1998 National Human Development Report there was concern expressed by villagers about the shift away from sustainable rural livelihoods, and the report found that people were 'willing to sell natural resources for cash if there were no other means of earning income...', that people were travelling 'further out to sea to catch more fish to earn cash', and others were 'cutting larger tracts of forest to create more space for gardening'. Together, 'these practices contribute to the trend of increasing non-sustainable use of resources evident in many parts of the country. However, the majority of the rural population feels little sense of urgency to use present resources within limitations' and only one of the 16 villages surveyed stated 'the need to conserve natural resources for future generations' (UNDP 1999:50).

Through international dialogue, such as conferences in Rio de Janeiro (1992 – 'The Earth Summit'), Johannesburg in 2002 (the World Summit on Sustainable Development) and the Rio +20 Conference in 2012, sustainable development has become an important organizing principle and rallying call on a broad range of development issues, ensuring that environmental, social and cultural dimensions – and questions of inter-generational equity – are considered alongside economic ones. Typically, sustainable development is understood as being built around three 'pillars' – an economic pillar, a social pillar and an environmental pillar.

The recent discussions on the post-2015 Sustainable Development Goals (SDGs) have included possibilities of broadening the MDGs to include issues of social inclusion, inequality, peace and security, food security, climate change, ocean management, forests, energy, livelihoods and disaster preparedness. In this way, sustainable development has become closely integrated with the concept of Human Development, and the two together

Within this context there is recognition of the importance of people's participation, civil rights and political freedoms, all of which are critical in shaping the understanding of, and practices towards, sustainable human development. The UNDP Administrator – Ms. Helen Clark – recently said that for sustainable human development to occur there is a need to address the ways in which:

'create the conditions for every person on this earth to have a life free of hunger and want, to be able to be educated, have decent shelter and work, access to health services, and the genuine freedom to choose to live lives which they value' (Clark 2012).

So sustainable Human Development requires attention to more than simply economic growth. When considering sustainable human development in Papua New Guinea today, there is a clear need to look beyond the 'economic boom' towards the economic, social and environmental opportunities and challenges that the booming extractives sector provides.

## 1.4 SUMMARY

Very localized and distinctive cultures and attitudes of self-sufficiency have developed and shaped the high dependence that Papua New Guineans have on their natural environment. The interplay of the protection and maintenance of this traditional relationship between the people and their natural environment on the one side and the dynamics of development and globalization on the other has made economic, social, environmental and cultural development in Papua New Guinea complex.

With Papua New Guinea on the brink of a major shift in its economic structure and prospects, thanks to new extractive industry projects, this report seeks to focus on **key choices and decisions that leaders need to make in the short and medium term to ensure that sustainable human development outcomes are maximised.**

The report draws on a growing body of regional and global experience and policy advice that can assist decision makers in Papua New Guinea with the more effective management of its mineral resources for sustainable human development. It also aims to ensure that Papua New Guinea's experience of managing this shift contributes to the global dialogue.

*Opportunities to transform non-renewable resources into meaningful improvements in human development, by definition, only occur once.*

The report argues that the economic boom driven by the extractives sector provides a huge opportunity for the nation to significantly improve wellbeing and human development for all citizens. Achieving this will require taking urgent and decisive actions now, along with clear choices, strong leadership and a sustained focus. Repeating the mistakes of the previous boom, and not drawing on international lessons, would be a lost opportunity. It will need a broad approach to deal with the transformation of extractive wealth into sustainable improvements in the levels of human development, beyond the current focus on economic growth. The economic benefits that will flow from the resources boom must be seen as a means, not the end: unless the economic growth also brings real improvements in personal freedoms, opportunities and capabilities, then the opportunities the economic boom provides will have been wasted. Opportunities to transform non-renewable resources into meaningful improvements in human development, by definition, only occur once.

## 1.5 THE STRUCTURE OF THIS REPORT

The remainder of this report comprises six chapters. It is structured around three overlapping themes and frames.

- 1) **Sustainable Human Development** is the central concern of this HDR. As Helen Clark noted, to achieve this, there is a need to appreciate 'the relationship between human development and the ecosystem in which it occurs', and to pay particular attention to the inequalities within societies (as well as between them).
- 2) As a way of structuring the discussion and analysis of Sustainable Human Development in Papua New Guinea, the widely recognized and understood **three 'pillars' of sustainable development** – economic, social and human sustainability – within which human capabilities and opportunities occur, provide the core of the chapter framework.
- 3) The recent **UNDP Strategy on Extractive Industry and Sustainable Development** provides a frame for the organization of policy options across the three pillars. It is used to highlight the connections between the extractive industries and sustainable human development in Papua New Guinea. This approach is particularly relevant because it recognizes that policy choices cut across, and have implications for, the three pillars of Sustainable Development.

Chapter 2 introduces the challenge of extractive-sector led development, then reviews the current state of, and prospects for the global extractive industry into which Papua New Guinea is now deeply embedded. It describes the concept of a 'resource curse', which has been shown to affect many resource-dependent economies. An introduction to Papua New Guinea's extractive industries, their place in the nation's development vision, and the regulation and governance of the sector is the focus of Chapter 3. Chapters 4, 5 and 6 are a complementary set of chapters structured around the three 'pillars' of sustainable development. Each describes and analyses the current state of sustainable human development in Papua New Guinea under one of these pillars, before looking more deeply at the contributions (positive and negative) of the extractives sector to each of the respective pillars.

In Chapter 7 the key findings of these three chapters are consolidated to provide an overview of the contribution of the extractive industries to sustainable human development in Papua New Guinea. The chapter looks at the complexity of these issues, with potential synergies between the social, environmental and economic elements of human development, as well as the need for clear decisions to be made concerning trade-offs between these different elements. The chapter concludes with a discussion about the various policy choices that the country faces, based on international experience, Papua New Guinea's own recent past, and wide ranging consultations. The argument is made that while these are not simple or easy choices, they require urgent decisions and action now to ensure that opportunities for real, sustained improvements in sustainable human development are achieved.

# CHAPTER 2

## Extractive Industries and Human Development: Managing extractive industries in a rapidly changing world.

### 2.1 INTRODUCTION

This chapter addresses two questions: **how do Papua New Guinea's extractive industries fit into current and likely future global commodity networks and markets, and secondly, what does international experience suggest the challenges of extractive resource dependence are?**

Papua New Guinea's extractive industries are located within regional and global networks of production and trade, driven by shifting consumption patterns, all of which influence prices, revenues and, ultimately, the contribution of the sector to sustainable human development in the country. A basic understanding of these global patterns highlights some of the risks for Papua New Guinea of being highly dependent on natural resources for its growth and development.

A dependence on extractive industries also poses challenges to improving human development. The chapter therefore finishes by reviewing the global evidence of how resource dependence can be a 'curse' rather than a blessing for economic and human development, and how this relates to Papua New Guinea.

### 2.2 GLOBAL TRENDS IN THE EXTRACTIVES SECTOR

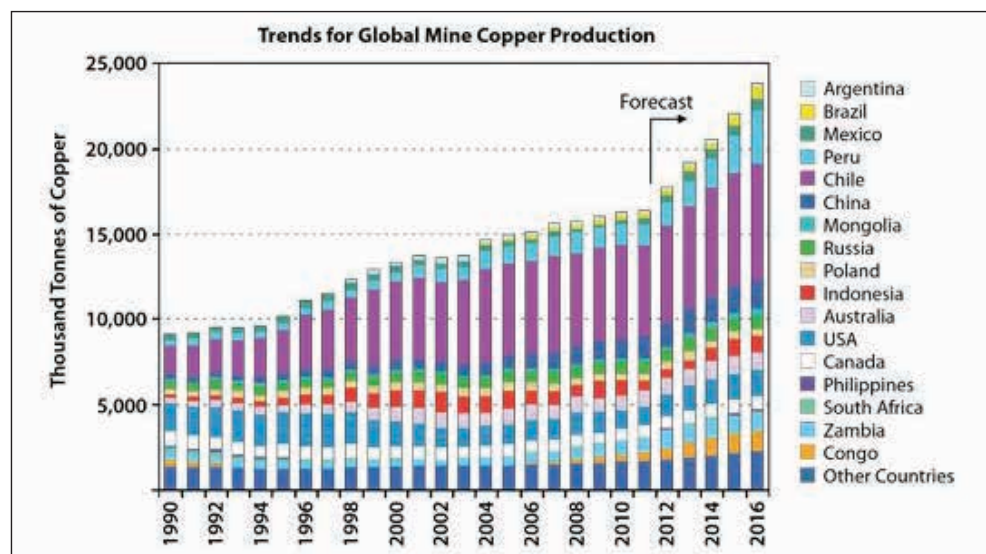
The geography of the global economy is rapidly changing. The 'global financial crisis' and its larger recessionary effects on the economies of Europe and the United States have shifted the focus of global growth towards the developing world. It is projected that China will overtake the United States as the world's largest economic power within a generation<sup>10</sup>, and India will join both as a global leader by 2050 [Dadush and Stancil 2010]. Annual GDP growth of more than 10 per cent over the period 2000-2010 has

made the Chinese economy central to global growth. Emerging industrial powers such as India, Brazil and Russia have experienced growth rates over the last decade that has outstripped most of the Organization for Economic Co-operation and Development (OECD) countries.<sup>11</sup>

Industrialisation and economic growth remain the main drivers for mineral and energy production and trade. Almost every product used in the modern world – from aircraft and infrastructure, to telecommunications and many forms of food (e.g. tinned products) – requires the use of some mineral, either as a constituent part and/or for the energy required in the production process. The extractive industries are an integral part of our daily lives and the global economy. As a result, demand for metallic minerals and energy is directly related to growth in different parts of the global economy, and has reflected the shifts in growth across that economy:

'The traditional dynamics in metals and industrial minerals markets, characterized by Western dominance, have profoundly changed' [Kefferpütz and Mildner 2013].

To give one example, between 2011 and 2012 European copper consumption fell by 9 per cent in the face of on-going economic woes, while Chinese copper consumption increased by 8 per cent. Continuing economic growth in the emerging economies is expected to underpin increasing demand for most metals in the medium-term (see Figure 2.1). This provides some certainty and stability around demand for mineral products, which in turn provides some medium- to long-term economic security for the prospects of mineral producing countries such as Papua New Guinea.



Source: Gonzalez, A. from Oracle Mining Corporation (2012)

Figure 2.1 Global Copper Consumption by Country, actual and forecast 1990-2017

<sup>10</sup> Using measures such as Purchasing Power Parity or PPP.

<sup>11</sup> Australia, one notable exception, has had its growth fuelled by the export of mineral commodities, particularly coal and iron ore, largely to China.

The global minerals scene however, is more complex than this data makes it appear. In the short-term, finding a balance between increasing demand and increasing production is complicated by the competitive nature of mineral production, with producers' responses to price signals delayed by the extended lead-time required to bring new investments into production (often in the order of decades from discovery of a deposit to first production). There are often complexities around financing these multi-billion dollar investments: falling commodity prices, and a reduced appetite for risk from banks and investors, saw a huge fall (56 per cent) in available mining investment financing in the second quarter of 2013, for example (Intierra RMG 2013). Such factors contribute to the **inherent, and apparently increasing, volatility of mineral commodity prices.**

Likewise the global LNG market – which Papua New Guinea joined in 2014 – is also entering a period of medium-term uncertainty. Global demand fell in 2012, leading to the first ever recorded fall in the LNG trade. While demand continued to rise in Asia, it fell dramatically in Europe due to a combination of the weak economic climate, a shift to coal-fired electricity production and the switch in the United Kingdom to greater levels of domestic (North Sea) gas production. American demand also dropped; a foretaste of an important shift as the United States is positioned to become a significant shale gas exporter over the next decade. This is likely to create uncertainty around pricing and hence revenue flows for producer countries, despite forecasts of continued rising demand for LNG in Asia. Japan, currently the largest market in Asia, accounts for 37 per cent of total global consumption, and grew at 11 per cent in 2012 but this is partly due to the closure (perhaps temporarily) of much of its nuclear capacity in the wake of the Fukushima catastrophe of March 2011 (Stream Research 2013). While growth in demand for LNG is likely to be strong in the medium-term (5-6 per cent per annum), after 2020 this is likely to slow to 2-3 per cent per annum (Ernst and Young 2013; IEA 2012).

The structure of the global mining and oil and gas industries is also changing, and three trends, which have implications for the sector in Papua New Guinea, are very apparent:

- 1) Control within the mining industry is becoming more concentrated, with production and processing increasingly managed conjunctively. The share of global production accounted for by the 10 largest producers has increased from around 20 per cent in 1990 to 33.5 per cent in 2010, and the largest 150 corporations now control around 85 per cent of global mineral production (Kafferputz and Mildner 2012: 20).
- 2) Corporations from emerging economies are carrying out an increasing share of production. In recent times these

economies have dominated global exploration expenditure and become an important part of merger and acquisition activity in the minerals sector. A 2012 PricewaterhouseCoopers review noted that 'although not yet dominant, certainly, with each passing year, growth market miners increasingly become forces to be reckoned with' (p.12). This trend is certainly reflected in the Pacific region, with significant interest and investment by, for example, the Chinese MCC-led Ramu Nickel mine in Papua New Guinea, and Vale (Brazil) investing in the Goro nickel mine operation in New Caledonia.

- 3) Related in part to this is a greater state presence in the mining sector, largely through holding a share in corporations, or more directly in the actual operations. This reflects a greater sense of 'resource nationalism' and attempts by mineral producing nations to exert greater control over strategic resources and the distribution of returns from the extractive operations (World Bank 2011, McKinsey Global Institute 2013).

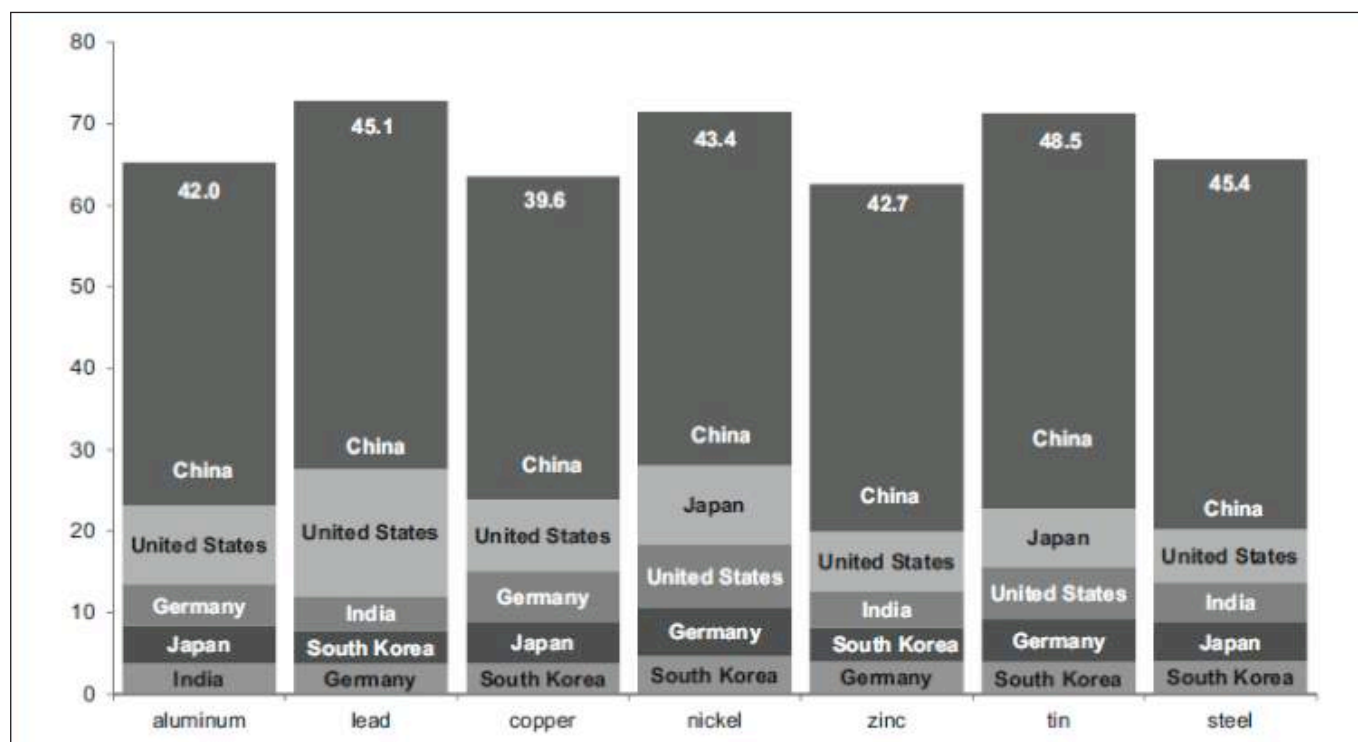
**Patterns of production and consumption are undergoing global shifts.** In terms of **production**, the trend is a shift away from the traditional core of North America and Australia towards Latin America, Africa, the Pacific and Asia, and particularly China. China is the largest single producer of aluminum, cement, coal, gold, iron ore, rare earth minerals, refined copper, tin and zinc.<sup>12</sup> Further, developing economies are now responsible for 47 per cent of world exports of ores, metals, precious stones and non-monetary gold, up from just 28 per cent in 1995. This trend is set to continue, with 50% of exploration costs now going to Latin America, Africa, Asia and the Pacific (Oxford Policy Management, 2011). McKinsey Global Institute (2013) notes that over half of countries that became 'resource-dependent' over the period 1995-2011 were low income at the time. This 'expanding resource frontier' also includes new possibilities such as deep sea/seabed mining, a technological frontier for the industry for which Papua New Guinea is at the leading edge.

In terms of the **consumption of mineral resources**, China is now the single largest user of mined metals (see Figure 2.2), accounting for about 40 per cent of total global metals consumption, and Asia as a whole now consumes more than half of all globally extracted minerals (Kafferputz and Mildner 2012:19). Continued growth through the height of the global financial crisis in other parts of the developing world (notably India, Brazil and the economies of South East Asia) has accelerated the shift in the share of the consumption of minerals from Europe and the United States to East and South East Asia.

<sup>12</sup> Kafferputz and Mildner (2012:17) report that of 52 raw materials of economic value identified in a British Geological Survey study, China was the leading producer of 28 (54 per cent) of these.



Figure 2.2 Consumption of Selected Metals, 2011. Shares of Top Five Consumer Countries (%)



Source: Kefferputz and Mildner 2012: 20

### 2.3 PAPUA NEW GUINEA'S CURRENT AND FUTURE POSITION IN GLOBAL MINERAL AND ENERGY MARKETS

Papua New Guinea is integrally linked into, and a significant part of, these fluctuating commodity markets: it is, in 2013, the 12th largest global gold producer, a small but strategically significant oil, copper and base metal producer, and soon to be a strategically located, medium-sized LNG producer, as well as the largest exporter of raw logs (International Tropical Timber Organization (ITTO) 2013) and the largest tuna exporter. This section briefly reviews the global prospects for the mineral commodities that Papua New Guinea produces, and looks at other factors (location,

investment climate) that could influence its future extractive industries.

Papua New Guinea's extractive sector is currently based around five commodities – gold, copper, oil, gas and nickel/cobalt. The price of each of these commodities exhibits different dynamics in response to external economic events (see Figure 2.3 below). Projections of these prices will be reviewed briefly here, as this is critical to understand potential revenue, investment and returns that ultimately impact on the prospects of these resources contributing to Sustainable Human Development within Papua New Guinea.

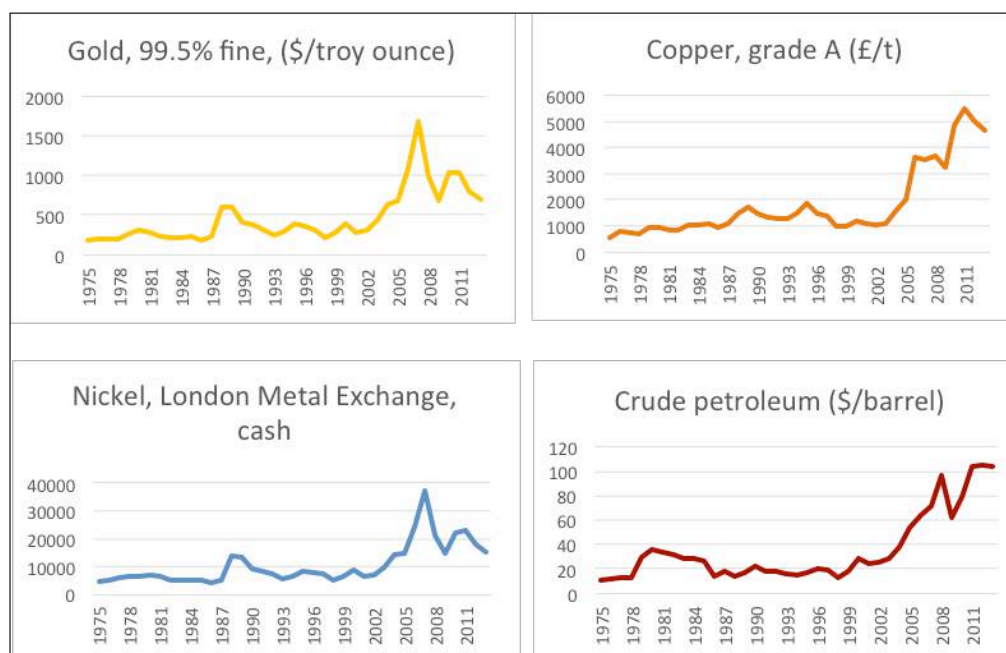


Figure 2.3 Price of Commodities between 1975 and 2011

Source: UNCTAD database.

Oil prices are related in part to growth and demand trends in the larger national economies, although increasingly other external factors are coming into play – shifts to other forms of energy, events in the main oil producing regions, and speculation on commodity markets. While the effects of these events tend to produce slow and more limited shifts in demand, they can produce rapid changes in oil supply, or at least the prospect of a shift in supply. This has driven significant volatility in the price in recent decades (see Figure 2.3 above): in six months in 2008 for example, the USD price of a barrel of crude oil fell by 75 per cent. Projecting forward, analysts present mixed outcomes: some (including the World Bank) see oil prices staying largely around the range they are now, others foresee a possible doubling of real prices by 2020.

Prices for LNG, Papua New Guinea's most recent export, increased dramatically from the late 1990s until the Global Financial Crisis (GFC), and subsequently have, along with significant volatility, dropped, although they have remained higher in Japan due to the closing of its nuclear plants following the April 2011 earthquake and tsunami. The prospects for growth in demand, particularly in Asia, remain strong (USEIA 1014) and this supports the likelihood of prices remaining relatively stable despite significant increases in supply, especially from US shale gas reserves. Forecasts from the World Bank do, though, show a gradual long-term decline in the Japanese LNG price through to 2025.

Gold has also experienced significant price volatility in recent times (see Figure 2.3 above), although the trend over the past decade has been one of a steady increase in price (from under US\$300 an ounce a decade ago to as high as US\$1,600 an ounce in 2012). The price drivers have traditionally been linked to uncertainty, with gold functioning as a 'safe' haven during times of global recession and in the face of wars and significant terrorist attacks. The dominant drivers of demand (jewellery in South Asia and the Middle East and more recently China) remain relatively constant and the price inelastic. The sell-down of Central Bank reserves can have significant short- and medium-term influence.

In addition, the global gold industry has come under cost pressure in recent years, often due to oil prices, as the large-scale mining operations are huge consumers of oil. Projections of gold futures vary enormously: some analysts project doubling of the price in the next decade, most others (including the World Bank) are less optimistic and see relatively flat prices – even lower than the present – at least in the short-term.

Demand for base metals (including copper and nickel) continues to be largely driven by growth in China, and the other emerging economies, especially in Asia. This trend intersects with a range of variable supply factors that can produce significant, rapid changes in prices – a 2013 ore export ban in Indonesia and events in the Ukraine contributed to a 47 per cent increase in nickel prices in the first 5 months of 2014, for example. Medium-term projections for both copper and nickel prices are moderate: the World Bank forecasts gradual declines in copper prices and slight rises for nickel through to 2025 (in nominal USD). As with Papua New Guinea's other resources, though, significant short-term volatility in prices is likely throughout this period.

In terms of the geography of global trade of these mineral and energy resources, Papua New Guinea occupies a strategic location with regard to the steadily rising demand for minerals and energy from China and the East and South-East Asian economies. In terms of LNG and base metal resources, this proximity to the expanding markets is one of the advantages that Papua New Guinea has over more distant sources, and China's interest in the mining sector also partly reflects its desire to secure closer mineral resources.

But location is not the only factor that drives future development of the minerals sector. A competitive investment regime is critical given the increasing competition between countries in attracting exploration and mining investment (see Box 2.1). This has resulted in frequent redrafting of legislation across the region to both reshape investment regimes and typically also tighten environmental management of the industry.

## BOX 2.1: THE PAPUA NEW GUINEA INVESTMENT AND BUSINESS ENVIRONMENT

Papua New Guinea's utilization and exploitation of its natural resources is still highly dependent on foreign investment for their development, and is influenced by international perceptions of the country as a site for foreign investment. On this scale, the country is ranked comparatively low. In part this relates to more general economic structures and conditions across the country: the World Bank (2013) for example notes that Papua New Guinea is ranked 104/165 in terms of 'Ease of Doing Business' (up four places from 2012), with 'Enforcement of Contracts' and 'Dealing with Construction Permits' being particularly poorly rated (166th and 159th out of 185 countries respectively). The American Heritage Foundation ranked Papua New Guinea 130th ('Mostly Unfree') out of 177 countries in terms of 'Economic Freedom', with moderately high scores for Trade, Labour and Monetary 'Freedoms' and low rankings on 'Property Rights' and 'Freedom from Corruption'. These latter two in particular influence the perception of the country as a destination for mining investment: in Bohre Dobear's 2013 version of its Ranking of Countries for Mining Investment ("Where Not to Invest"), Papua New Guinea was ranked 22nd out of 25 countries, and rated poorly on 'managing social issues', 'permitting delays' and 'corruption'.

While such measures do ebb and flow (and Papua New Guinea's geological prospects and attraction remain high in terms of the potential quantity and quality of its natural resources) they do highlight that in the global context, having an abundance of natural resources does not mean there will always be the capital available or the interest of investors to develop these.

In sum, then, the evidence points to the relative stability of prices for Papua New Guinea's extractive sector commodities in the medium- to long-term, but this will be marked by a high degree of short-term volatility, as experienced over the past decade. Price volatility will also intersect with changes in the value of the currency and this produces a significant range of potential scenarios for the value of Papua New Guinea's extractive sector output through time, with implications for the returns to the country from these resources. The global commodity and energy markets are such that the government can expect continuing interest in its resources in the foreseeable future. At the same time, it will also be vulnerable to volatility in revenue flows from the sector – as both an equity holder in different operations, and as a fiscal revenue collector – due to the inherent volatility of these energy and commodity markets.

## 2.4 THE 'RESOURCE CURSE'

'Mining offers the opportunity to catalyze broad-based economic development, reduce poverty and assist countries in meeting internationally agreed development goals, including the MDGs, when managed effectively and properly...' (UN 2012:40).

### **Natural resources can provide a boost to economic growth and overall development for nations, but they do not always do so.**

The term 'resource curse' was developed to describe the evidence that showed that instead of being a 'blessing', resource dependent nations<sup>13</sup> appeared to perform less well than resource poor nations in terms of economic and social indicators (see Box 2.2 below). It is also referred to as '**the paradox of plenty**'.

*Natural resources can provide a boost to economic growth and overall development for nations, but they do not always do so.*

It is important to keep in mind however, that not all elements of the arguments around the 'curse' of natural resources apply to all resources, all of the time, in all places. Instead the evidence is that, in general, countries that have economies that are dependent on various forms of natural resource extraction are more likely to display some or all of a range of negative effects. In other words, it is not a given that resource dependence necessarily leads to particular countries displaying all the symptoms of the 'resource curse'.

## BOX 2.2: WHAT IS 'THE RESOURCE CURSE'

There is a huge amount of research and experience that explores why a nation's dependence on natural resources for economic growth can produce a range of unwanted effects – from negative rates of growth to civil conflict. Below is a list of the commonly documented effects often attributed to the 'resource curse' includes:

### **Resource-dependent countries are, on average, poorer, more unequal, and with lower levels of human development**

The relationships between resource dependence and poverty are complex and mixed. Cross-country comparisons show that poverty is higher in resource-dependent countries (27 per cent compared with 19 per cent in non-resource dependent countries on average in the 2000s), but declined faster in the resource-dependent countries (by 9.4 percentage points compared with 5.1 percentage points). Overall, resource-dependent countries had a lower Human Development Index (HDI) (0.61 compared with 0.69 for non-resource-dependent countries, 2011). Evidence also suggests that resource dependence is bad for social development, and that inequality is higher in resource-dependent countries and that 'countries dependent on natural resources tend to perform comparatively worse in several indicators of human welfare, such as life expectancy, education, child mortality or in the human development levels' (Vittorio 2011).

### **Resource-dependent countries do not grow faster: indeed they tend to grow slower**

While the high levels of investment, technology transfer, generation of exports and government revenue that the extractive sector typically provides should be expected to have higher growth rates, evidence shows that this is not necessarily the case. A common explanation for slow growth is the so-called "Dutch disease" where the appreciation of the local currency, as a result of increased demand for a country's resources, leads to a loss of international competitiveness in the non-resource sectors (effectively limiting economic diversification), particularly in the more labour-intensive agricultural and manufacturing areas. A related effect is the heightened vulnerability to external economic shocks.

<sup>13</sup> Although definitions vary, 'a **resource-dependent country** is typically defined as a developing country where the share of oil, gas and mineral exports makes up 25 or more per cent of total exports. Resource-dependent countries also typically generate a substantial amount of their foreign exchange and fiscal revenues from extractive industries. In contrast, a resource-rich country is one that may have substantial endowments of mineral resources, but may not necessarily be economically dependent on the resource extraction sector' (UNDP 2013).

### ***Extractive industries generate few jobs***

The large-scale extractives sector typically generates few jobs. Of all sectors, mining has the lowest employment elasticity, meaning that the growth in that sector generates less employment compared with the other sectors of an economy. The capital-intensive nature of extractive industries and weak linkages to the rest of the economy can result in limited employment generation. The enormous investments in the extractive sector, then, are not proportionally related to job creation.

### ***The incidence of violent conflict is higher in resource-dependent countries***

The exploitation of oil, gas, and minerals is one of the key factors that can trigger and sustain violent conflicts and human rights violations. Contributing factors include inequality-related grievances; expectation mismanagement; and higher probability of corruption. For countries emerging from conflict, extractive related activities increase the likelihood of relapse to conflict within five years by twofold. As was the case in the Niger Delta and in Bougainville, conflicts are often the result of unaddressed grievances (e.g. related to environmental damages) and unequal distribution of resource rents.

### ***Institutions and governance suffer in resource dependent nations***

Overall the evidence supports the view that institutional quality is both a factor in the resource curse, and is typically undermined by a high dependence on natural resources. Thorpe et al (2012:169) argue that the processes of 'institutional development dominated by extractives tends to weaken key elements needed if development accessible to all and careful of the future is to be incentivated and sustained, at the same time as the direct effects of extractives cause inequality, conflict and environmental damage, necessitating even more the absent or deficient institutions' (Thorpe 2012:169). Mehlum et al (2006:16) simply states that the resource curse is an outcome of 'the dangerous mix of weak institutions and resource abundance'.

### ***Resource windfalls increase corruption, especially in non-democratic regimes***

Rent-seeking and short-term profit maximization objectives of key agents in resource-dependent countries often prevail over long-term sustainable human development objectives. One measure of this is that a higher level of corruption is perceived to exist in resource-dependent countries (corruption perception index 3.4 on average) compared with non-resource-dependent countries (corruption perception index 4.3 on average) (Transparency International?). In addition the evidence is that elections, participation and the rule of law outcomes are worse in resource-dependent economies.

### ***Resource extraction can lead to negative environmental and health impacts***

The key environmental impacts of extractive industries include soil erosion and degradation, loss of biodiversity, and contamination of ground and surface water by mining waste and processes. Oil spills and oil flaring, which have significant negative local impacts on soil, water and air quality, are major threats. Workers in oil, gas and mineral mining industries, as well as people in surrounding communities, can be exposed to significant health hazards and risks. A serious concern in informal, small-scale mining of alluvial gold deposits in developing countries is related to the use of metals and chemicals such as mercury and cyanide, known to have serious effects on human health.

Discharges into rivers and oceans can affect fish and other aquatic life; as well as people, livestock and wildlife consuming this water and fish. Informal settlements and towns develop around mining operations, which generate a range of social and environmental problems.

### ***The socio-economic effects on affected communities can be devastating***

Evidence globally suggests that affected communities can suffer a range of devastating effects connected to loss of land, breakdown of social bonds and networks, and increasing levels of alcohol abuse, prostitution, and violence. Development-induced migration is a major source of socio-economic disruption, and disputes over the distribution of the benefits and costs of an operation can be a source of internal conflict.

### ***The risks of extractive activities are not equally borne by men and women or by all age groups***

There is growing evidence that shows extractive industry related activities are not gender neutral, nor do they affect all age groups equally. The key gender impacts of extractive industries growth are: (i) economic impacts, such as increased poverty and economic dependence on men; (ii) environmental and land-related issues, which increase women's vulnerabilities and may have both economic, health and security related consequences; and (iii) negative social impacts, including violence against women and girls as well as children, alcohol and other substance abuse, increased crime and violence, as well as the spread of HIV/AIDS and other STDs and so-called "boom town" effects such as high rates of in-migration.

Taken together, the 'resource curse' symptoms in Box 2.2 undermine the early optimism of Ginsburg (1957:211) that 'the possession of a sizeable and diversified natural resource endowment is a major advantage to any country embarking upon a period of rapid economic growth'. Instead, as Bebbington (2012:217) found for resource dependent territories in Latin America, the result is that they appear 'more polarized, more uncertain, more worried and still poor'.

Importantly though, **the negative impacts of resource dependence are not inevitable**: the 'resource curse' is not the only possible outcome. There are a number of countries that have managed to use extractive resources to underpin impressive, sustained growth and human development. In historical terms Australia, Canada and the United States were all founded on natural resource wealth, and in the contemporary context developing countries such as Botswana and Chile are mineral dependent economies that have avoided many of the more destructive elements that are associated with the 'resource curse'. Within the region there are positive lessons also to be drawn from Indonesia, Malaysia, Mongolia and Timor-Leste, for example. Case studies of positive outcomes and their policy connections, including many of the countries listed here, are presented in Chapter Seven to highlight elements that may be relevant to Papua New Guinea's situation.

Governments, donors, industry and non-government stakeholders all have a strong interest in helping countries avoid the resource-curse trap. There is evidence that the recent global boom in mineral dependence is taking place within an environment that recognises previous policy mistakes, based on a better understanding of both benefits and costs of minerals extraction (Oxford Policy

Management (OPM), 2011). While the best approach for any one country will vary depending on the specific local institutional, political, economic, historical and cultural features, there is now a set of well-accepted principles for avoiding or mitigating the worst aspects of the 'resource curse' that centre around 'good governance [especially in terms of macro-economic and fiscal policy], strong institutions, effective regulation and rigorous environmental and social safeguards' (Organisation for Economic Co-operation and Development–Development Assistance Committee (OECD-DAC) 2008:22). An approach framed around context and country-specific variations of these principles, and the use of innovations and policy options discussed below, can provide an opportunity for resource wealth to contribute to more inclusive forms of growth, poverty reduction and human development. This is what this report seeks to do for Papua New Guinea.

## 2.5 SUMMARY

There is considerable international policy experience and research that can provide insights for Papua New Guinea into managing the more malign effects of resource dependence. With appropriate selectivity and contextualising, many of these lessons can provide valuable guidance for Papua New Guinea as its resource dependence increases in the immediate future. The following chapter provides an introduction to the extractive industries of the country and their prospects, as well as a discussion of the role these resources play in development policies and planning, and the regulatory and governance environment within the country.

# CHAPTER 3

## The Extractive Industries in Papua New Guinea: Managing the resources boom.

### 3.1 INTRODUCTION

The chapter seeks to answer two questions: **what is the extent and nature of Papua New Guinea's current extractives sector, and secondly, what form does the policy, regulatory and governance environment take within which this sector operates?**

Papua New Guinea has experienced a great deal of extractive activity for well over a century. By international definitions Papua New Guinea is a resource dependent country; this will be heightened with the onset of production from the PNG-LNG project. A variety of urgent policy choices present themselves to the country as it seeks to effectively manage the massive economic growth the project will spark: the existing regulation and policy regime around the sector is an important starting point for this.

This chapter begins by providing a descriptive overview of Papua New Guinea's extractive industries before outlining the ways in

which these extractive industries (and natural resources more generally) have been viewed as developmental tools by successive governments in Papua New Guinea. The final section of this chapter outlines the regulatory environment, institutions and instruments that seek to shape and regulate the sector and its effects.

While the focus of this report is Papua New Guinea's mineral resources – justified on the grounds that these dominate the economy and debates within the nation – the country also has considerable stocks of renewable resources, particularly forestry and fisheries (see Appendix 1). These resources pose very different management issues to mineral resources, although there are also many parallels in terms of strategic level policy and operational best practice (such as around community consultation and participation).

### 3.2 THE EXTRACTIVE INDUSTRIES IN PAPUA NEW GUINEA

This section provides an overview of the extractives sector in Papua New Guinea: its history, current developments, and future prospects. This background is an important starting point for the chapters that follow.

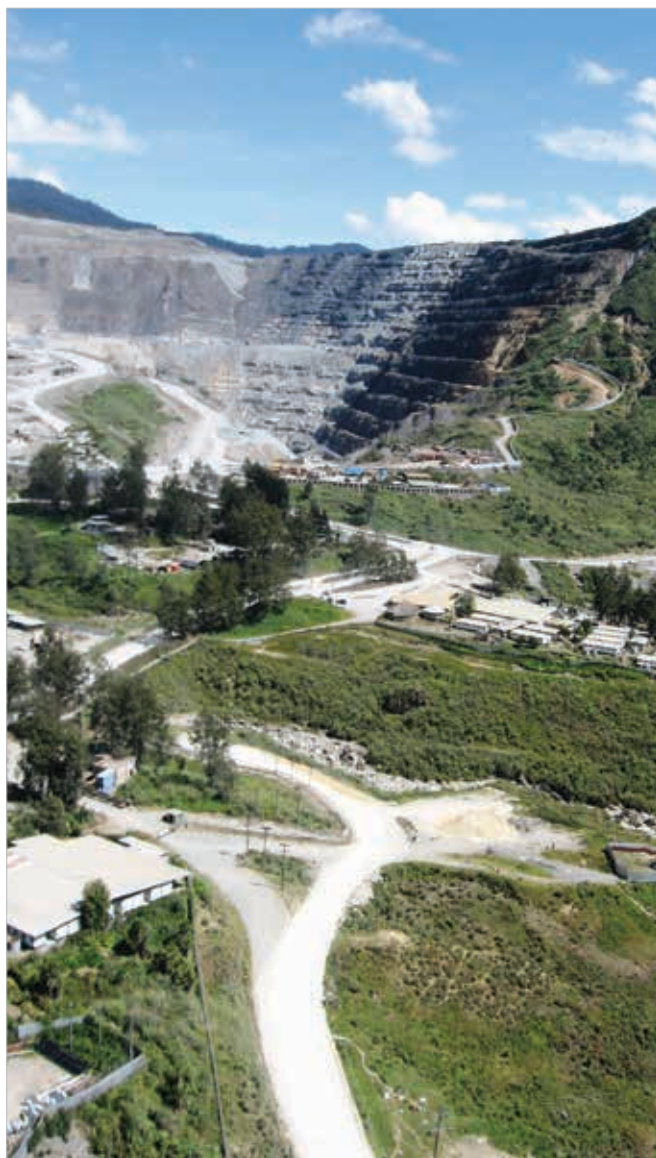
#### MINING

Mining has been woven through Papua New Guinea's history for over a century. Since Independence large-scale mining has dominated the economic and political landscape in Papua New Guinea, as well as having significant social and environmental effects. It has brought huge economic benefits and generated massive conflict, culminating in the tragic and bloody civil war on Bougainville.

Papua New Guinea currently has several 'world class' mines producing from some of the many substantial deposits of gold, silver, and copper across the country (Figure 3.1). Each of the current (or recent) mines is briefly introduced here (see also Table 3.1).

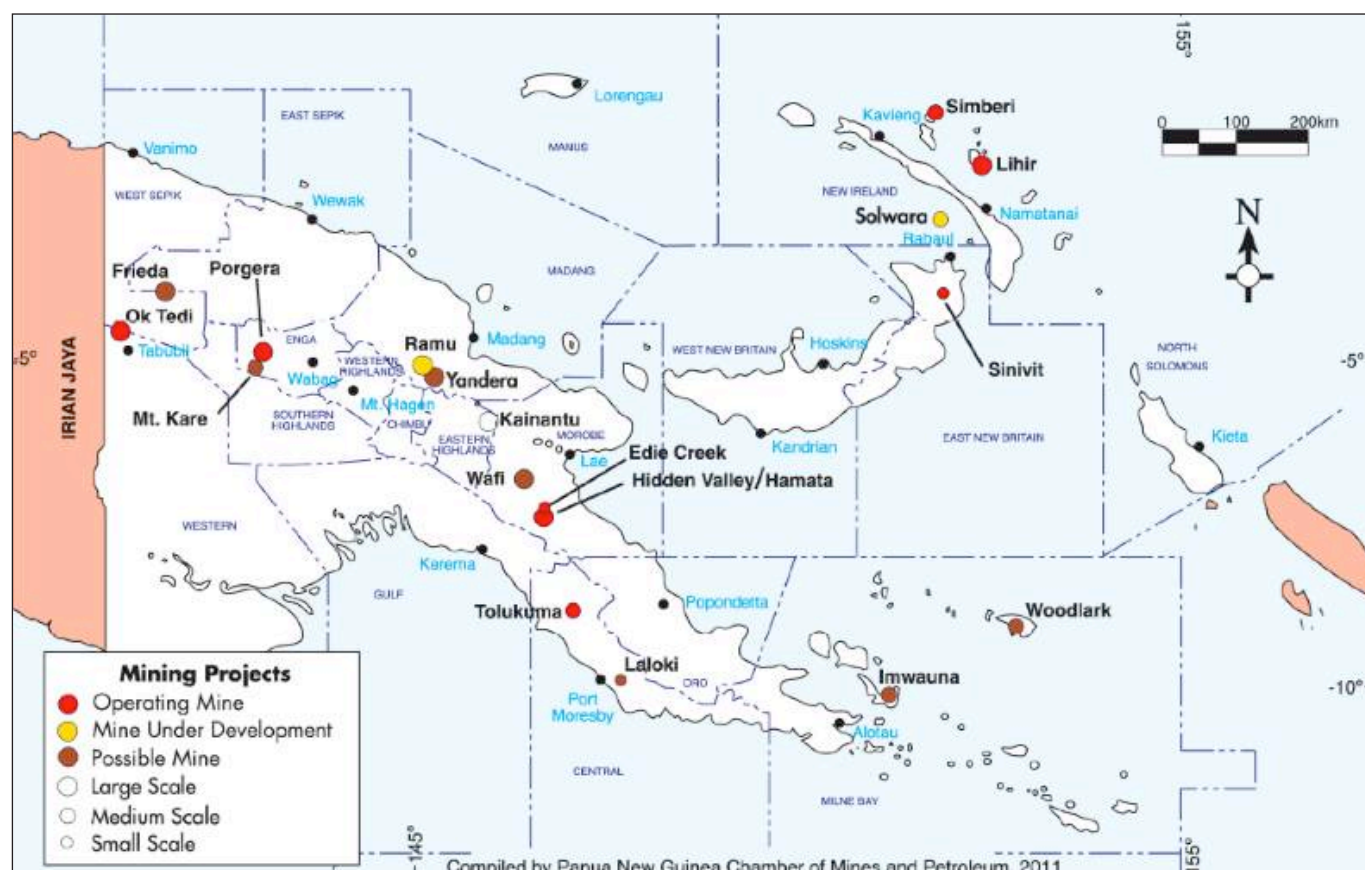
**Bougainville Copper Limited's** (BCL) Panguna mine on Bougainville was the first of the large-scale mines in the modern era. A subsidiary of Rio Tinto (Conzinc RioTinto Australia (CRA)) led the exploration and development of the mine from the mid-1960s. As well as the economic imperatives that drove the development of the mine, there were political pressures too: the Australian Administration were keen to see a viable industrial scale mine developed as pressures mounted in the late 1960s for a transition to Independence for Papua New Guinea (May 2012).

Panguna quickly became a highly successful mine economically, and until its forced closure in the late 1980s it was the cornerstone of the formal economy. Between 1972 and 1988, the production of 30Mt of copper and 9.6 million ounces of gold made up 40 per cent of the country's exports and provided 17 per cent of government revenue (May 2012). 13 years after the 2001 Bougainville Peace Agreement, discussions are currently being held about the re-opening of the Panguna mine.



Porgera mine, 2007

Figure 3.1 The location of the major mining projects and prospects in Papua New Guinea 2011.



Source: PNG Chamber of Mining and Petroleum

Table 3.1 Papua New Guinea's mining operations

Mine	Owner/ Operator	Resource extracted	Production (latest year)	Mine life (actual and anticipated)
Panguna	Rio Tinto (54%) Papua New Guinea State (19%) Public (27%)	Copper & Gold	166,000t Cu 13,862kg Au (1988)	1972 – 1989
Misima	Placer Pacific (80%) Papua New Guinea State (20%)	Gold		1986 – 2004
Ok Tedi	PNGSDP (63%) Papua New Guinea State (37%)	Gold & Copper	125,000t Cu 405,000oz Au (2012)	1984 – 2023
Porgera	Barrick Gold (95%): Landowners and Enga Provincial Government (5%)	Gold	507,000 oz Au (2013)	1992 – 2023
Lihir	Lihir Gold Limited (100% Newcrest Mining)	Gold	650,000oz (2013)	1997 – 2035
Hidden Valley	Newcrest (50%) and Harmony Gold (50%)	Gold	200,000oz (2011)	2009 – 2023
Ramu	Chinese Metallurgical Construction Group (MCC) (85%); Highlands Pacific (15%)	Nickel & Cobalt	15,900t Nickel 1,400t Cobalt (2013)	2013 –

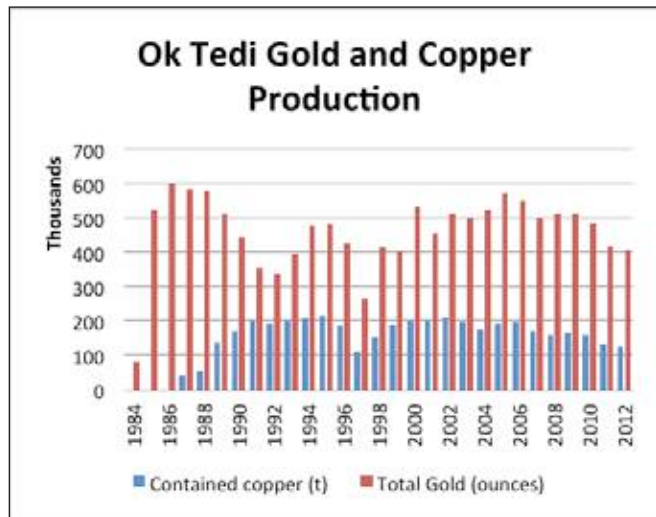
Sources: Mineral Resources Authority (MRA) 2012, Various Company and Bank of Papua New Guinea (BPNG) Reports.

The **Misima** gold mine in Milne Bay was opened in 1986, and was operated by Placer Pacific, a subsidiary of Placer Dome (now Barrick Gold). This medium-sized gold mine produced 3.6million ounces of gold between 1986 and 2004 and utilized a Deep Sea Tailings Placement (DSTP) for tailings disposal.

The **Ok Tedi** mine began operations in 1984, after a complex set of political negotiations that saw the recently independent state of Papua New Guinea reject the conditions set down for the development by the original multinational (Kennecott) that had discovered the deposit (Jackson 1984; Pintz 1984). BHP, then the largest Australian multinational miner, took over the development and construction of the mine from the late 1970s. Figure 3.2 shows a significant decline in production over the past decade that is anticipated to continue until closure in 2023 (if Mine Life extension is approved).

The mine has been dogged by controversy on a number of fronts. There were substantial cost overruns during construction, and little in the way of financial returns to its shareholders (BHP, Inmet and the state of Papua New Guinea) over the first 15 years of its life. Although it did however, contribute significantly to government revenues and GDP per capita over this period, at a time when the closure of the BCL mine on Bougainville had placed considerable strain on government revenue.

Figure 3.2 Ok Tedi Gold and Copper Production



Source: Ok Tedi Mining Limited (OTML) 2013

It is the massive environmental impact of the mine that has been the most high profile aspect of the Ok Tedi operation, discussed further in Chapter 6. Most recently the nature of Ok Tedi's ownership has been altered by the Papua New Guinea government's decision to resume control of the Papua New Guinea Sustainable Development Program (PNGSDP) share of the operation. This contentious decision now means Ok Tedi is the first fully state-owned large-scale mine in the country, and represents a significant shift in sentiment towards increasing state control over the sector.

The second of the current operating mines is the **Porgera** gold mine. Now 95 per cent owned and operated by Canadian Barrick Gold – the world's largest gold producer – Porgera began construction in 1989, after a lengthy period of exploration and negotiation. Porgera was initially an extremely productive and financially successful operation – in 1992 the 1.4million ounces it produced made it the third largest global gold producer. This early success led the government of the day to forcefully acquire an increase in state equity in the operation from 10 per cent (half of which was reserved for landowners and provincial government) to 25 per cent. The Porgera operation was also notable for the substantial levels of compensation and other revenue flows to the local community: again the basic template for the economic returns to local stakeholders for all resource developments has its origins at Porgera (see Box 4.4 in the following chapter).

The largest current gold producer is the **Lihir** gold mine in New Ireland Province, where production started in 1997. The mine is currently owned by Newcrest, and like Misima, uses DSTP for the disposal of its tailing. The mine has a long anticipated mine life (to 2035), and a recent plant upgrade provides considerable potential to extend this, depending on gold prices and costs. While there are

similar sets of opportunities and challenges for human development at Lihir as for Bougainville, Ok Tedi and Porgera, Lihir's relative inaccessibility and small environmental footprint (with DSTP) have allowed it to contribute more positively to local sustainable human



Alaia Rock and mining operation, Lihir.

development than other operations (see Box 6.3).

**Hidden Valley**, a gold complex in Morobe Province, began production in 2009. It currently employs around 2,000 mostly national staff and has a planned mining life of 14 years. While Hidden Valley is the first major mine in Papua New Guinea to retain all its tailings in a tailings storage facility, waste from the construction phase caused considerable damage to the environment and communities downstream of the mine, and disputes over compensation from this took several years to resolve.

The **Ramu Nickel/Cobalt mine** is a US\$1.5 billion investment – the first major non-Western investment in the mining sector, and first non-copper base metal project in the country. Located in Madang Province it is expected to reach full production later in 2014. The project is projected to produce 31,000t of nickel and 3,000t of cobalt annually for at least 20 years. Production is split between the upland mine site area at Kurumbukari and a refinery plant at Basamuk, 134km away on the Rai coast. The start-up of the mine was delayed by two years over legal action taken by landowners who sought to stop the DSTP proposed for the project. By this stage however, the environmental permits for the mine had been issued and the legal action was unsuccessful.

There are a number of **smaller mining** operations across the country. These include Tolukuma (in central Province, near Port Moresby), Simberi (New Ireland), and Sinivit (East New Britain). The smaller operations (all gold producers) tend to produce scaled-down costs and opportunities in terms of human development compared to the larger operations, although each has features that make them quite distinct: Tolukuma, for example, is 100 per cent state-owned through Petromin Holdings, and Sinivit is the only heap-leach operation in the sector. Commodity price fluctuations are of greater effect on these smaller operations and both Tolukuma and Sinivit have gone through partial (or total) shutdown for periods of time.



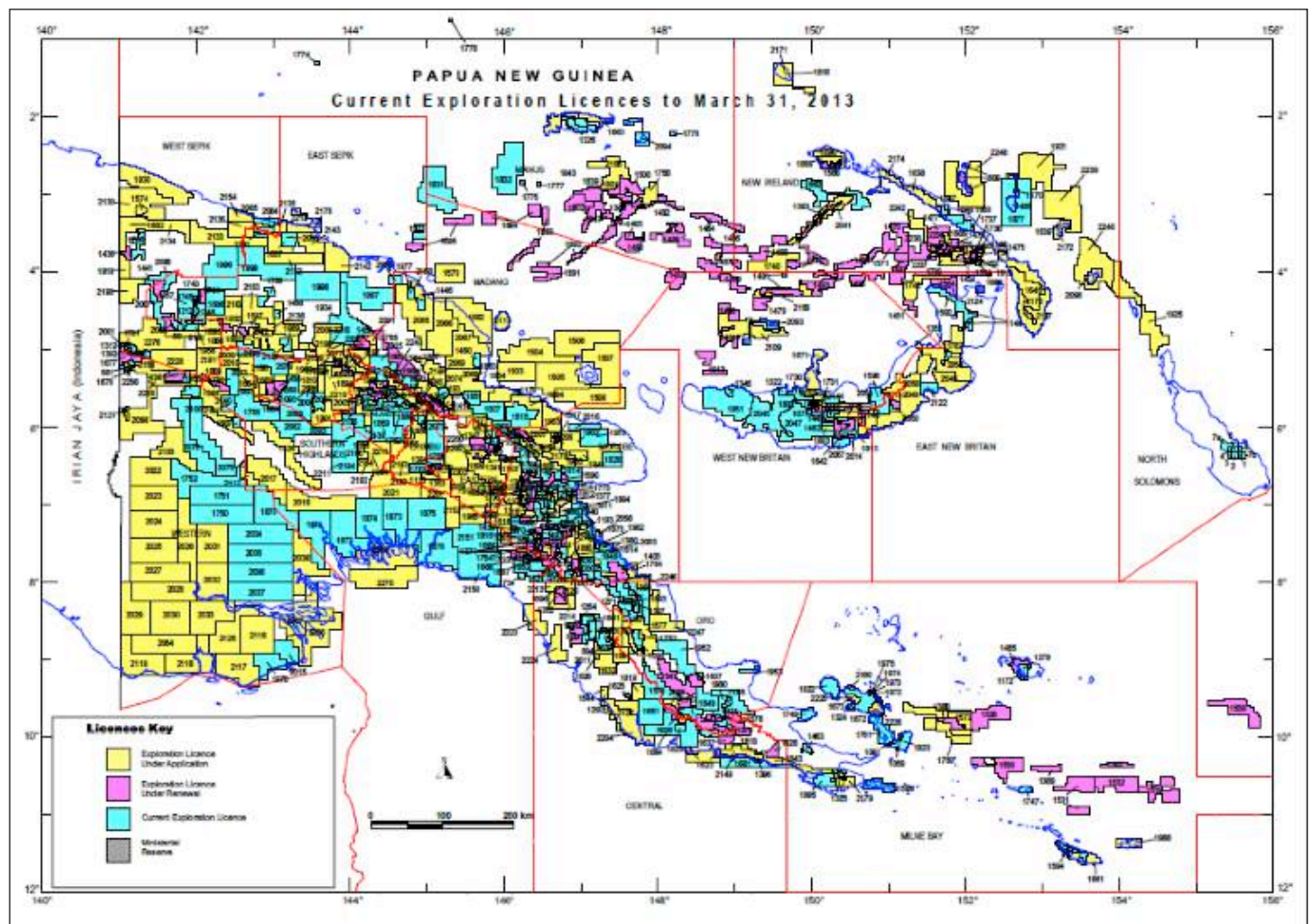


*Alluvial Mining in Bougainville*

Small-scale, mostly alluvial gold mining (or Artisanal and Small-scale Mining [ASM]) occurs in a number of sites, and although there are only 2,500 licenses issued for this (Mek 2011), other estimates are that it provides a living for up to 100,000 (Crispin 2003). Nationally the Household Income and Expenditure Survey (HIES) recorded 0.4 per cent of people in the informal sector as being employed in 'mining', with higher figures in the Islands and Momase regions (HIES 2009/10). Estimates of production vary – a figure of around 4t (140,000 ounces) of gold per annum (Susapu and Crispin 2001) is still used as the basis for estimates that the sector produces between K180-200million worth of gold (Mek 2011). The Mineral Resources Authority (MRA) recorded an official production from the sector of 95,000 ounces in 2012 (worth K347million), but noted that gold leaving the country illegally across borders could total the same amount again. This activity occurs at sites in a number of provinces – Wau and Bulolo remain the largest concentration of small-scale miners, with other important areas including Mt Kare (Enga), Maprik (East Sepik), Kainantu (Eastern Highlands), Bougainville, Oro Province, Milne Bay and East New Britain.

**Exploration projects** continue to attract mining investors in Papua New Guinea, particularly with the recent strength of commodity prices. Exploration, planning, and construction work is at various stages in relation to other large copper and/or gold deposits at Freida/Nena (East Sepik/ Sandaun Provinces), Wafi-Golpu (Morobe), and Yandera (Madang). More broadly, Figure 3.3 shows that much of the country is currently under an exploration licence, highlighting the continuing international view of Papua New Guinea's high prospectivity. This includes current exploration for the world's first seabed mining project off the coast of New Ireland by Nautilus Minerals. Together these ensure that if commodity prices remain strong, Papua New Guinea is likely to continue to have 3-4 large-scale operating mines over at least the next thirty years, despite a recent global downturn in exploration activity. Mining is very much part of the country's economic and development landscape for the foreseeable future.

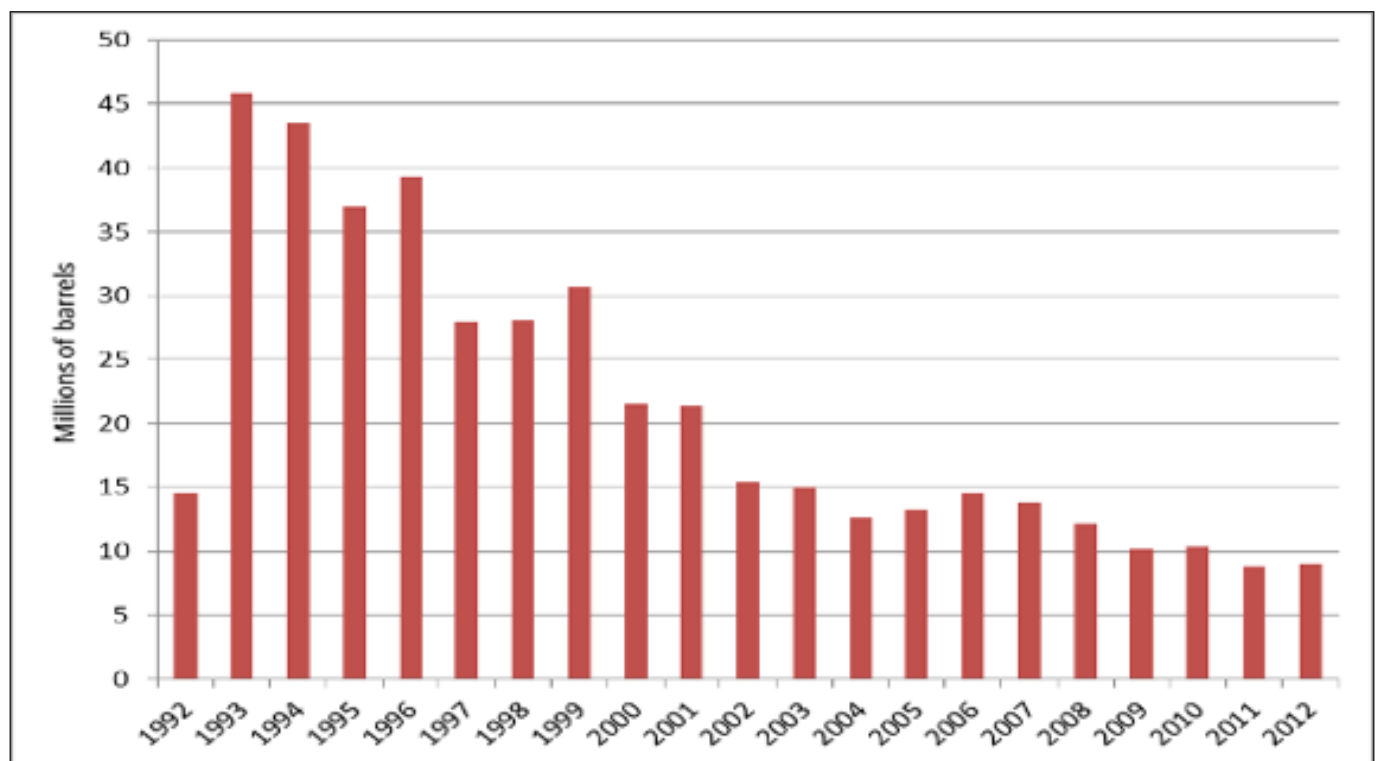
Figure 3.3 Mineral exploration licenses, March 2013



Source MRA

## OIL AND GAS

Figure 3.4 Papua New Guinea Oil Production, 1992-2012



Source: BPNG 2013

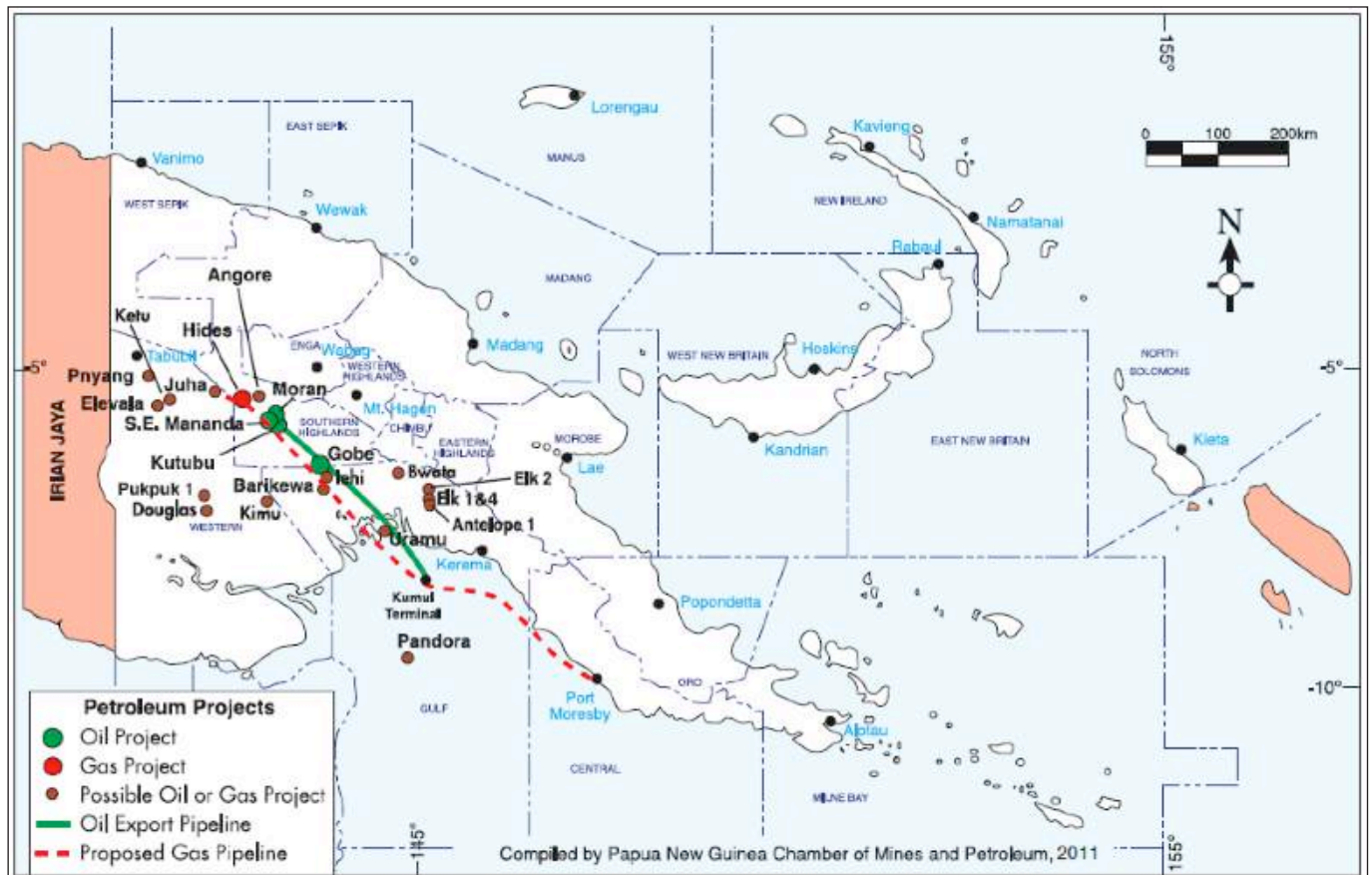
Crude oil has been produced from the Kutubu project since 1992 (see Figure 3.5). Production has dropped through time, from an initial 45million barrels in 1993 to less than 10million over the last two years. Currently oil is produced from the Kutubu, Moran, and Gobe oil fields (Figure 3.5). The Kutubu field was initially developed by a local subsidiary of Chevron, which in 2003 was bought out by Oil Search Ltd, the Australian-based, Papua New Guinean incorporated company that is the operator of and controlling interest in all the operating oilfields. Since 1992, over K37billion (US\$13billion at 2014 prices) worth of oil has been exported by Papua New Guinea (BPNG 2013). The current Oil Search workforce is around 1,100, with another 1,500 direct contractors. (Oil Search Limited 2013).

is connected by over 800km of overland and underwater pipeline.

The construction phase of the PNG LNG project required, at its peak, 21,000 staff and contractors and involved an unprecedented level of logistical coordination and infrastructure development, capped by the construction of a 4km runway at Komo for the delivery of very large specialized items by air.

**Oil and Gas exploration** across Papua New Guinea is also active. There are two advanced gas projects: the InterOil Gulf LNG project (in partnership with Total, the French energy major, and Oil Search) is based around the Elk/Antelope fields (that potentially holds 7-12tcf of gas – around the same as the PNG LNG project) and

Figure 3.5 Mining and Petroleum operations and advanced exploration targets in Papua New Guinea



Source: Chamber of Mining and Petroleum

An oil refinery, owned and operated by Singapore-based Puma Energy established close to Port Moresby, processes Kutubu oil and means Papua New Guinea supplies a significant proportion (around 70 per cent) of its own oil needs.

The **PNG LNG project**, owned by ExxonMobil PNG (EMPNG) (33.2 per cent), Oil Search (29 per cent), National Petroleum Company of PNG (17 per cent), Santos (13.5 per cent), Japan PNG Petroleum (4.7 per cent), Mineral Resources Development Corporation (MRDC) (2.8 per cent) and Petromin (0.2 per cent), is the largest investment to have occurred in Papua New Guinea by some distance. Indeed the US\$19billion project is greater than the existing investment in all other existing extractive projects in the country combined. The project, which is managed by ExxonMobil, started exporting gas in mid-2014, and integrates production sites across three provinces (Hela, Southern Highlands and Western) with the Hides Gas Conditioning Plant in Hela, and processing, liquefaction and storage sites outside Port Moresby in Central Province. The entire project

could come on-stream as early as 2020-21; and the Stanley gas-condensate field in Western Province, a US\$300million joint venture between Horizon Oil, Osaka Gas, Talisman Energy and Mitsubishi that received Government approval in early 2014. As with mining exploration, petroleum exploration tenements in various stages of application or approval cover the bulk of the nation’s land area, and much of the near-shore environment.

### 3.3 THE EXTRACTIVE INDUSTRIES IN PAPUA NEW GUINEA’S POLICY FRAMEWORK

Papua New Guinea has a number of legislative and policy frameworks that relate to the extractive industries, natural resource management and human development. Since Independence, economic and development planning has viewed these resources as a central way to drive economic growth and provide the basis for broad-based development. In recent years, national planning documents have also sought to re-balance this focus by connecting back to early concerns regarding environmental protection and the

use of 'Papua New Guinean ways' of shaping development. This discussion locates the country's mineral resources and policies in the Government's overall developmental vision for the country.

These can be seen to operate in three tiers – the Constitution, the policy framework, and the enabling legislation. Relevant sections of each of these are reproduced in Appendix 6. The first two are discussed here, with a particular focus on aspects of policy that relate to the intersection of resources and development. The more operational aspects of legislation and the institutions charged with enacting the legislation will be discussed in the following section.

## THE CONSTITUTION

The Papua New Guinea Constitution, developed in the years before Independence, contains provisions around the protection of human rights, including the right to life, liberty and security of person, and the right to take part in political activities. The significance of Papua New Guinea's natural environment and resources is highlighted in the National Goals and Directive Principles in the Constitution, the foundational document for the nation (see Appendices 6). The 'wise use' language of the fourth National Goal and Directive predates by a decade the language of the Brundtland Commission's now famous definition of sustainable development. Importantly the fifth and final of the National Goals and Directive Principles also declares 'our fifth goal to be to achieve development primarily through the use of Papua New Guinean forms of social, political and economic organization'.

To a large extent, the challenge that faces Papua New Guinea is bound up in the tension between having a globally connected, economically-driven extractives sector, and a need to deliver broad-based improvements in human development in ways that reflect 'Papua New Guinean forms of social, political and economic organization'. In other words, development that both employs processes and delivers outcomes that are locally meaningful and acceptable. These tensions flow through to the various central government development planning policies.

## POLICY FRAMEWORKS

In the past seven years, the government of Papua New Guinea has formulated a development policy framework consisting of the Vision 2050, the 2010-2030 Development Strategic Plan (DSP), and the 2011-2015 Medium-Term Development Plan (MTDP). Although originally developed through largely independent processes, they are conceived as a set of nested and cascading plans. Most recently, a National Strategy for Responsible and Sustainable Development (NSRSD) was produced by the Planning Minister as an addendum to the DSP and is expected to be incorporated into the revisions to the MTDP underway in 2014.

The first three frameworks, and their priorities and targets are based on the assumption of accelerated economic growth based on an expanding extractive resource sector. As a result, they give an important indication of how revenues from natural resource extraction are expected to be used and to contribute to human development across PNG.

The strategic direction for Vision 2050 is that, 'Papua New Guinea will develop and grow the manufacturing, services, agriculture, forestry, fisheries and eco-tourism sectors from 2010 to 2050. This direction will enable economic growth by 2050 to be broad based, ensuring that disposable household incomes will be much higher than at present. These initiatives will enhance our socioeconomic performance and improve our overall HDI ranking.'

The challenge therefore is, 'How do we shift an economy that is currently dominated by the mining and energy sectors, to one that is dominated by agriculture, forestry, fisheries, eco-tourism and manufacturing, between 2010 and 2050?' (Vision 2050, 2009)

The **Vision 2050** proposes that the current heavy reliance on resources does not adequately balance the three pillars of sustainability: economic, social and environmental. The Vision calls for a shift through time (as originally envisaged in the first post-Independence (1977) policy on mining) from a mineral-dominated economy to a one that can better balance environmental and social goals alongside economic growth.

The Development Strategic Plan (**DSP**) aims to set 'the direction for the economy to move from an economy heavily dependent on non-renewable natural resources to one which has a broader base with dynamically developed industries in both secondary and tertiary sectors and with well-connected and vibrant markets'. The policy still recognises the importance of petroleum and mining industries, setting goals that include a doubling of mineral exports, while also striving to minimise the adverse impact of mining on the environment. There is a clear tension here between the broad aim of shifting away from a resource development economy and the goals of, for example, doubling mineral exports by 2030. Some of this tension is further reflected in specific targets articulated within the MTDP.

The **MTDP** retains the aim of doubling mineral exports, with the comment that 'The minerals sector has been the key source of exports and revenue to the Government over the years. There remains considerable mining potential so the sector will continue to play a critical role in Papua New Guinea's development.'

The recently launched the National Strategy for Responsible and Sustainable Development (**NSRSD**) represents an attempt at a paradigm shift with regards to the development path to achieve PNG Vision 2050. It sets out a development road map for a more socially and environmentally responsible and sustainable socio-economic growth model for Papua New Guinea. The strategy emphasizes the need to respond to the growing revaluation of the environmental capital of the world, and an increasing understanding of the threats of unchecked pressure and damage. While very much in line with the messages of this Report, the challenge will be to address the tensions and trade-offs between extractive industries, economic growth, social responsibility and environmental sustainability. The strategy does however make it clear that Papua New Guinea has a unique global opportunity to chart a new development path, one that combines responsibility and sustainability. This report will offer

support – through concrete policy suggestions and options – to this paradigm shift that promotes more sustainable and inclusive forms of development.

### 3.4 REGULATING THE EXTRACTIVES SECTOR IN PAPUA NEW GUINEA

One of the key lessons from international experience outlined in Chapter 2 is that institutions and governance are critical to translating revenues from the extractives sector into improvements in human development. In this section and the next, the formal regulatory framework, and the quality of governance within this framework in Papua New Guinea, are reviewed.

The Papua New Guinea mining and petroleum sector is regulated by the State under two main Acts: the Mining Act (1992) and the Oil and Gas Act (1998). These Acts are in turn the responsibility of the MRA and the Department of Petroleum and Energy, and there are Ministerial portfolios for each of these areas. The Department of Mineral Policy and Geohazard Management is primarily responsible for policy development in the minerals sector (and has led the review of the Mining Act during 2013-2014).

sets of agreements: a Mine Development Contract with the state, Compensation and, if required, Resettlement Agreements with affected communities, and a set of Memorandums of Agreement (MoAs) between the developer, the National Government, the respective provincial government, and the affected landowners. The last of these provide for the distribution of benefits between the various levels of government and the landowning community. These MoA negotiations occur in the context of a Development Forum, a mechanism initiated in 1988 that ensure local representatives and sub-national government are involved in discussions and negotiations over the distribution of benefits, and result in formal agreed Benefit Sharing Agreements (BSAs) (West 1992; Filer 2012).

Concerns over the capacity of The Department of Minerals and Petroleum in the late 1990s led to World Bank assistance (which is on-going) to support the restructuring of the department. This eventually resulted in the creation of the MRA, which operates as a stand-alone statutory agency tasked with regulating, monitoring and facilitating the mining industry. There are plans to provide a similar statutory authority for the petroleum industry. There is also provision for other government departments to become involved in, and oversee, some aspects of the sector.

## BOX 3.1: REGULATORY PROCESS – FROM EXPLORATION TO EXTRACTION AND CLOSURE

Within each of the key Acts, there are broadly similar provisions for the development of new mining, oil and gas operations. They begin with licensing systems for the issue of Exploration Leases (ELs). An EL is valid initially for 2 years and requires an application process that clearly delineates the area of the EL being applied, along with information about the proposed exploration program and the applicant. This application is then advertised and a Mining Warden's hearing held (usually within or close to the area covered by the EL), at which public comment is sought on the proposed exploration: often these also attract comment on the applicant. Following the Warden's report, there is an in-house technical assessment of the application and an assessment by a Mining Advisory Council (MAC), made up of representatives from different government departments and agencies. The recommendation of the MAC is then passed on to the Minister for endorsement (or rejection), and if successful, the EL is then issued.

Retention of an EL requires a continued level of expenditure, and regular reporting of work programmes and results. The feasibility stage of a development is also covered by EL, and it is at that stage that negotiations with lease landowners become more significant.

In addition, securing a tenement also requires Social Mapping and Landowner Identification studies, as well as Social and Environmental Impact Assessments. Additional plans covering training and localization, local business development, procurements and contracting are also required. One difference between the oil and gas sector and mining is the proscribed use of Incorporated Land Groups for representation and structuring of landowner representation and distribution of benefit shares in the Petroleum Act, but not the Mining Act.

Translation of an exploration target into a mining operation requires application for a Mining Lease (ML) or Special Mining Lease (SML) (or a Petroleum Production Licence (PPL) in the case of oil or gas). Securing this tenement entails the applicant negotiating three

These include the Department of Environment and Conservation (DEC) (responsible under the Environment Act 2000 for reviewing and approving the environmental and social impact assessments and the on-going environmental monitoring programs of the mines)



Waste Rock filling a valley, Ok Tedi Mine, 2011

and the Department of Labour, which is primarily responsible for the monitoring of the required Training and Localisation Plans (TLPs) of the operations (discussed further below in Chapters 6 and 4 respectively). The Department of Commerce and Industry heads a committee that monitors all negotiated provisions for 'local content' and the preferential procurement of local goods and services. The effects and outcomes of these various instruments are discussed in the following chapters.

The fiscal regime around mining and petroleum has been relatively stable over the past decade and exhibits most of the features of comparative international regimes (Daniel et al 2000). The major elements include corporate tax, royalty and provision for an Additional Profits Tax (APT) on resource rents in the oil and gas sector. The corporate tax elements are shown in Table 3.2 below. A royalty of 2 per cent of wellhead production for oil and gas, or 2 per cent of gross mining production, is applied. An additional profits tax originally applied across the whole sector was dropped from the fiscal regime for mining in 2003. At present the APT on oil and gas accumulated net revenues over a certain percentage threshold is 7.5-10 per cent. There is also a 'Fiscal Stability' clause that developers may choose to adopt that allows for an assurance of stability of the fiscal regime over the life of the project, in exchange for a premium on the corporate tax rate (Emerson and Kraal 2014).

One innovation within the Fiscal Regime with particular significance for human development is the use of the Tax Credit Scheme. This

makes an income tax credit (as an offset to income tax payable), up to the value of 0.75 per cent of assessable income derived in the year of income, available for expenditure on prescribed infrastructure for mining, petroleum and gas operations.

A review of the taxation options for the extractives sector highlighted a number of areas, mostly minor, where improvements to the regime could be made to bring it closer to other international regimes (Emerson and Kraal 2014). These include the regularization of fiscal terms between oil and gas operations through use of a standard legislated framework, a shift away from equity participation, the re-imposition of an Additional Profits Tax (APT) on the mining sector, along with a change in the method of calculation and the rate of APT in the oil and gas sector, and the removal of some tax incentives.

The legislation and mineral policy provides for a relatively high degree of community participation in the development of new projects, from the Mining Warden's Hearing to the negotiations around compensation and resettlement agreements, and participation in the Development Forum. In the context of international comparisons however, there is no explicit or formal requirement for Free, Prior Informed Consent (FPIC) from communities, something that it is argued would be difficult to secure in the Melanesian social environment (Macintyre 2007).<sup>14</sup> There are requirements around processes for land ownership identification, for social and environmental impact assessments and, importantly, for participatory negotiating processes around the

Table 3.2 PNG Corporate Tax rates by sector, 2014

	Resident	Non-Residential
Mining	30%	40%
Petroleum - Existing Projects	50%	50%
Petroleum - New Projects	45%	45%
Petroleum - Incentive Rate	30%	30%
Gas	30%	30%

Source Emerson and Kraal 2014

<sup>14</sup> This veto only applies at the EL stage.

distribution of benefits from the project, such as the Development Forums and Benefit Sharing Agreements (BSAs). What are less obvious are the formal mechanisms that determine who among the community or the landowning group gets included within the various operation-specific consultation and negotiation processes. In some instances the company and/or the state may seek to broaden participation, but local interests or cultural factors may constrain the full participation of some groups, including women, youth or other marginalized groups. While sub-surface mineral resources remain in State ownership, the requirement for new mining projects to negotiate with the identified owners of the land on top of these resources does provide a framework for the negotiation of benefits and development outcomes with communities.

New initiatives include a draft Mining Act, currently under consideration by the Autonomous Bougainville Government (ABG) that provides for joint State and landowner ownership of sub-surface resources, and a proposal by the Governor of New Ireland Province and former Prime Minister Sir Julius Chan for a National Mining Bill that would vest ownership of minerals in landowning communities. Recent sector Development Forum and other community-level negotiations have specifically sought to broaden representation, including specifically targeting women's representation (see chapter 6 below).

Despite the **relatively robust legislative regime and the institutional framework** outlined above to support this, there are **continuing concerns regarding the resourcing and capacity of these institutions**. None of the departments or authorities charged with regulating the sector appears to be adequately resourced. The Department of Petroleum and Energy (DPE), for example, has been unable to complete a landowner Clan Vetting Exercise (only the first of two stages have been completed, although ideally the process would have been completed before the start of production) that is a prerequisite for the distribution of local revenue flows to those affected by the PNG LNG project. This was largely due to an absence of budget allocation, 'even though this had been requested' (PNG Chamber of Mining and Petroleum 2014). There is also limited capacity to deal with the technical reports and impact assessments made by industry and submitted to the respective Departments for review and approval. This points to the significant differential capacity between the multinational corporations and government as regulator. It also places heavy reliance on self-governance by the industry.

The existing regulatory framework described above has provided a framework for the expansion of the extractive industries over the past three decades, and has secured significant economic benefits for communities and the nation as discussed below. Yet it has so far largely failed to deliver agreements and processes that are able to prevent conflict within and between communities, and between communities and the developer or the state. An additional point is that the policy and regulatory institutional framework is challenged by the quality of governance within PNG.

### 3.5 POLITICAL FRAMEWORK AND GOVERNANCE

*'PNG's development prospects depend critically on the quality of its public institutions.'* (Review of the PNG-Australia Aid Treaty: 11).

Prior to contact with outsiders, Papua New Guinea was made up of a large number of small-scale, self-governing polities. Leadership traditionally was earned by one's conduct and behaviour within

these systems. This achieved form of leadership produced local 'big-men' – men whose reach was typically limited to their own group. However, an emerging fragmentation within clan groups gave rise to individual families demanding to be recognized as separate landowners. These local, traditional forms of governance now sit, often uneasily, alongside the introduced formal institutions and processes.

A large number of relatively weak political parties, and stronger alignment of MPs with tribal or regional interests, characterize the political party system in Papua New Guinea. Some political parties are unstable, holding temporary alliances or lacking a distinctive political ideology. Under these conditions, there has in the past been relatively little focus on national goals and ambitions.

For its size, Papua New Guinea has a complex (and hence costly) decentralized system of government, with three tiers of government (national, provincial and local level governments), and four levels of administration (at the national, at the provincial, district and Local Level Government (LLG) level). In total the country is divided into 4 regions, 22 provinces, 89 districts, and 319 LLGs. This complexity is a consequence of a diverse population, which retains a stronger allegiance to and trust towards sub-national levels (district and province) than the national. Most of these sub-national levels of government, given greater fiscal and political autonomy under the Organic Law on Provincial and Local Level Government (OLPLLG) in 1995, have historically performed relatively poorly in terms of delivery of services and development to their respective populations.

*"I really desire and would like to see our country in the future as a corrupt free nation. Corruption must be removed"*

EZEKIEL KERUA, 18 YEARS OLD

This will be illustrated with regard to health and education delivery in the sections below.

At the national level there are presently 33 ministries and over 140 government departments and agencies, some of which are duplicated at provincial and district levels. **This extensive structure of governance, a reflection of the diverse and challenging physical and social environments**, adds to the inherent complexity and cost of government. Devolution and decentralization of administrative function are integral components of the system, with each tier of government funded largely from the national budget.

Concern has been expressed by many commentators at the quality of governance, although there have been some positive developments in recent years. The political instability of 2012 (which followed a decade of relative stability) has largely settled down. There are a number of donor-supported initiatives that have sought to provide greater accountability and transparency of government revenue flows, particularly at the sub-national level of government, although these have not yet translated into improved development outcomes. The regulatory environment has also improved in certain regards. Corruption, a significant component of poor governance in recent decades, is being addressed at various levels in society, and there are solid moves to establish a more permanent Independent Commission Against Corruption. The country also has very strong churches that, with government funding, run about half of the country's health and education systems.

Balancing these positive signs, there remain areas where serious problems of governance persist. The widespread perception is that corruption – particularly within national government – is still serious, and that the public sector capacity is weak and declining. While an Ombudsman’s Commission has a mandate to provide oversight on the Leadership Code, there is no national human rights institution to oversee human rights promotion and protection. Deep, and in some quarters growing, concerns are voiced about the law and order situation, which is a problem not only in Port Moresby, but in some other urban centres and some rural areas. The eruption of tribal fighting provides a constraint on development when it occurs, and election-related violence is a threat to the democratic process in some, mostly highland, areas. Linked to this is also the concern that access to the formal systems of justice in Papua New Guinea is limited, particularly in rural areas. Police investigations into crimes are often deficient due to a combined lack of capacity, resourcing issues and sometimes unwillingness. In many cases people do not have access to legal advice. This is a problem for people seeking legal remedy for violations, and it is an obstacle to effective implementation of legal safeguards.

More generally there is an obvious ‘**politicisation of development**’ that can be linked back to the nature of ‘bigman politics’ (Allen and Hasnain 2010). One manifestation of this is the increasing budget allocation over which the local member has discretion for district development spending, known as the District Service Improvement Program (DSIP). With each District and Open Member of Parliament (MP) having an allocation of K10million, over K1billion (out of a total budget in 2014 of K15billion) for the delivery of local development is in the hands of the local member rather than integrated through the systems and institutions of government administration itself. Without clear accountability for these funds, local corruption and poorly integrated projects are an increasing problem (Wiltshire 2013). In addition, the politicization marginalizes the bureaucracy, undermining administrative sustainability in times of changes of government. It also increases the risk of development decisions being driven by political motives, rather than the intention to improve levels of sustainable human development.

The variable governance performance is reflected in the various governance indicators produced by multilateral organisations such as the World Bank and the Asian Development Bank. Generally these indicators suggest that voice and accountability, political stability and regulatory quality are stable and/or improving, and the ability of government to develop and produce plans at the country and sectoral level – especially central control and decision-making – is strong. The World Bank indicators suggest, though, that Papua New Guinea’s performance in relation to corruption, government effectiveness, and the rule of law is still relatively low (ADB/World Bank 2012). Policies and institutions supporting social inclusion and equity, public sector management and policy implementation are weak, despite recent improvements (ADB/World Bank 2012).

Together, these governance challenges pose particular problems when it comes to translating resource revenues into broad-based human development. On the one hand, good recent economic growth and sound economic macro-policy, a relatively stable

political environment over the past decade, the strong policy development capacity, and positive recent moves to combat corruption and provide greater transparency of sub-national revenue flows, are regarded as contributing to an improved governance environment for the country, and for the extractives sector. On the other hand, many of these are the fundamental

*“Successful countries owe a lot to an environment in which all ideas, good and bad, are exposed to review and vigorous debate.”*

THE GROWTH COMMISSION, 2008

steps required for improving government effectiveness, rule of law, and control of corruption, all of which are crucial to the conversion of resource revenue into public goods for sustained, broad-based improvements in human development for the benefit of the majority. For this to occur successfully, **institutions and the quality of governance are critical.**

### 3.6 SUMMARY

This chapter has reviewed the past, present and future of the extractive industries in Papua New Guinea. The review has illustrated the ways in which the history and challenges the country faces are linked, mirroring to an extent the broad global trends and issues discussed in Chapter 2. Papua New Guinea has considerable experience of natural resource extraction, largely driven and controlled by outsiders, but with support from local groups and individuals, that extends well over a century. Between 1973 (the commencement of mining on Bougainville) and the end of 2013, over K142billion of minerals (in nominal terms) has been produced and exported, including 1,400t of gold (worth over K60billion), 4million tonnes of copper (worth just over K35billion) and 460million barrels of oil (worth K37billion) (BPNG 2014: Tables 8.2 and 8.5). Papua New Guinea’s 40 year history of large-scale resource extraction has generated much locally-relevant experience in the form of novel policy approaches and practices – some now recognised as world-leading – as well as some poor policy choices.

International experience emphasises the importance of quality institutions and governance, critical for the translation of resource wealth into equitable and sustainable human development. In this context, a variety of urgent policy choices present themselves to the country as it seeks to effectively manage the economic growth associated with the new PNG LNG project and other significant resource projects. A first step is to review the context of human development progress within Papua New Guinea, and the ways in which extractive industries have contributed to human development. Drawing on the definition of sustainable human development from Chapter 1, the following three chapters do this, each organised around one ‘pillar’ of sustainable development, starting with the economic.



# CHAPTER 4

## The Economic Dimensions of Extractive Industries in Papua New Guinea

### 4.1 INTRODUCTION

This chapter addresses the question: *how have Papua New Guinea's extractive industries contributed – positively and negatively – to economic development and inclusive and sustainable human development.*

The economic contribution of extractive industries to the country's development, and in particular to Human Development, can be thought of as follows: the mines, oil and gas operations generate revenues at national, provincial and local levels. These revenues have the potential to create sustainable improvements in incomes, livelihoods and improved standards of living for individuals, communities and the nation. As noted earlier, this has not happened during previous resource 'booms' in Papua New Guinea, with the country at times exhibiting many of the characteristics of the 'resource curse'. The challenge is to ensure that the policy choices made now do not let the economic opportunities, provided by this current extractives boom, slip away.

The chapter firstly reviews the **macro-economic setting** and progress since Independence (with a focus on the last decade), and then outlines the **extent and nature of poverty and hardship** – mostly in terms of economic dimensions – before specifically drawing out the **contributions of the extractives sector to economic aspects of human development** in Papua New Guinea. Examples of both positive and negative contributions are provided to highlight, where appropriate, best practice elements within the sector, and to point to lessons and experience from the past that should be heeded.

Overall this analysis explicates the significance of the extractive sector to the economy of the country. It is a specific form of resource dependence. Since 1975 the sector has dominated foreign investment and exports – as highlighted recently by the LNG project – and sparked growth in related construction and service sectors. Its connection to the formal economy in other ways has been more modest, with smaller and variable contributions to government revenue, GDP and employment. In this sense the connections between the sector and livelihoods and sustainable human development are not as explicit and significant as they potentially could be. This report seeks to highlight ways of improving these connections between the economic effects of the sector and sustainable human development.

### 4.2 THE MACRO-ECONOMIC SETTING

This section provides an analysis of the formal economy of Papua New Guinea over the last decade. The influence of the extractives sector will be obvious here, but a detailed and critical analysis of this contribution is reserved for later in the chapter.

Papua New Guinea has experienced strong economic growth over the last decade. Between 2007-2012, the annual GDP growth rate remained above 5 per cent (Figure 4.1 ADB 2014). The drivers of this growth varied over this period, but a constant feature has been the strength of the construction sector, much of it connected to the extractives industries and exemplified by the construction of the PNG LNG project from 2010 onwards. While growth is expected to spike at 20 per cent in 2015, it is then expected to slow in the coming years.

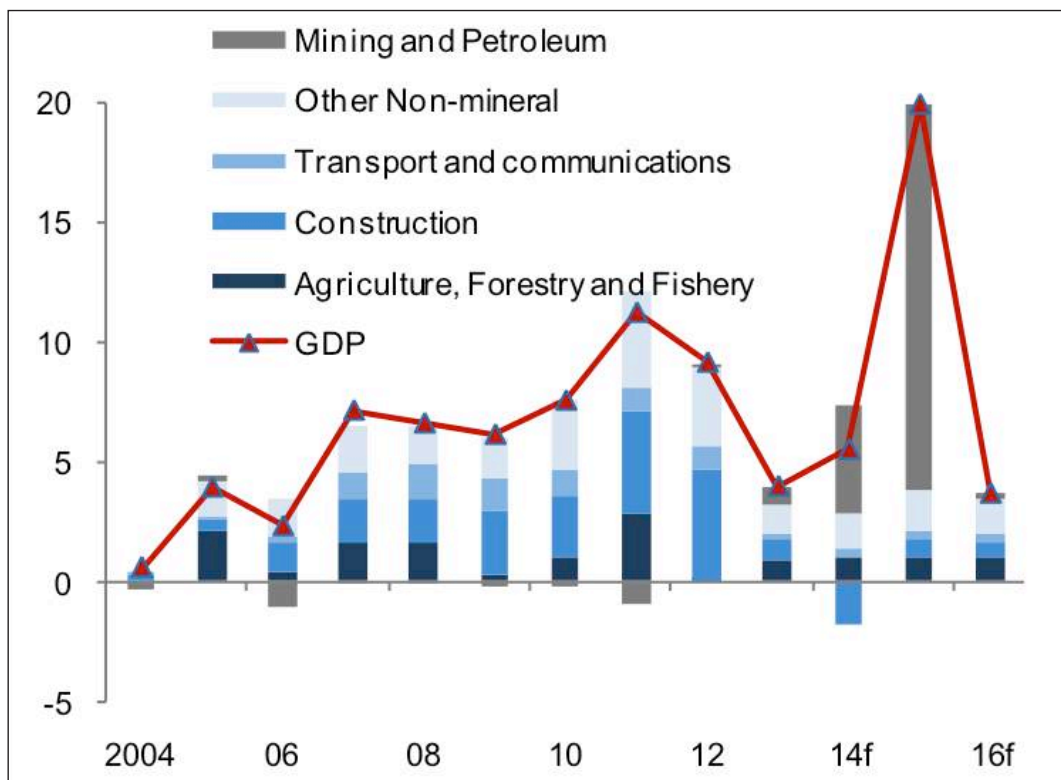


Figure 4.1 Real GDP growth, Papua New Guinea, 2004-2016, by sector

Source: ADB 2014

Exports of minerals and crude oil have constituted 70 per cent of total exports since 2000 (see Figure 4.9 below). The trade balance averaged around 15 per cent of GDP during the period from 2001 to 2008. Inflows of foreign investment declined during 2009 and

of GDP in 2001 to 45 per cent of GDP in 2011. Akin to other cases of natural resources-fuelled economic booms, the real exchange rate appreciated significantly as the prices of non-tradable goods and services soared, generating Dutch disease symptoms (see

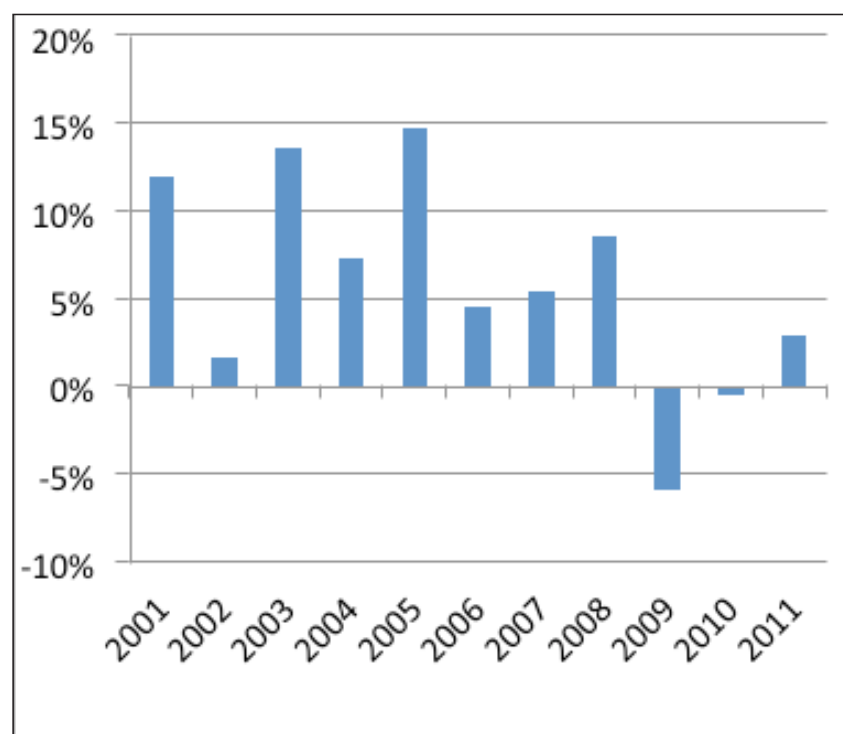


Figure 4.2 Foreign Investment flows as a proportion of GDP 2001-2011

Source: Filer et al (2013)

2010 for the first time in the last 15 years and picked up in 2011 and 2012 with the onset of the PNG-LNG construction (Figure 4.2).

Revenues – largely derived from the extractive industries – financed both government and private expenditure, leading to a booming non-tradable sector, particularly construction, and services. One effect of this was that the primary sector declined from 52 per cent

Box 2.2) and inflationary pressure. As a result, the non-tradable sectors, particularly construction and real estate, were key drivers of and beneficiaries from economic growth in Papua New Guinea over the last decade, mostly concentrated in Port Moresby and the other major urban centres – Lae and Mt Hagen (see Table 4.1 below).

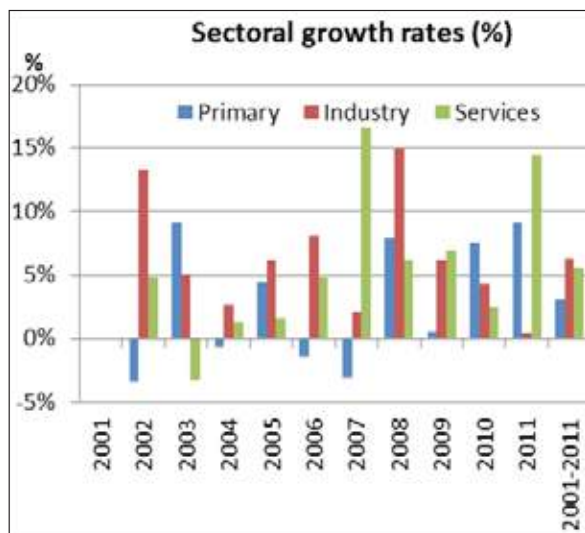
Table 4.1 GDP by sector, 2002-2011

Mine	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: World Bank 2013b

The sources of growth will shift from these non-mineral sectors to the mineral sector as the PNG-LNG construction winds down and gas exports start to dominate exports. Meanwhile, given the majority of the population continues to rely on subsistence and/or commercial agriculture, the agricultural sector remains the most important part of the economy for the bulk of the population. It contributes a third of GDP (UNCTAD 2012, Table 4.1). Growth in

Figure 4.3 Sectoral Growth Rates (%)



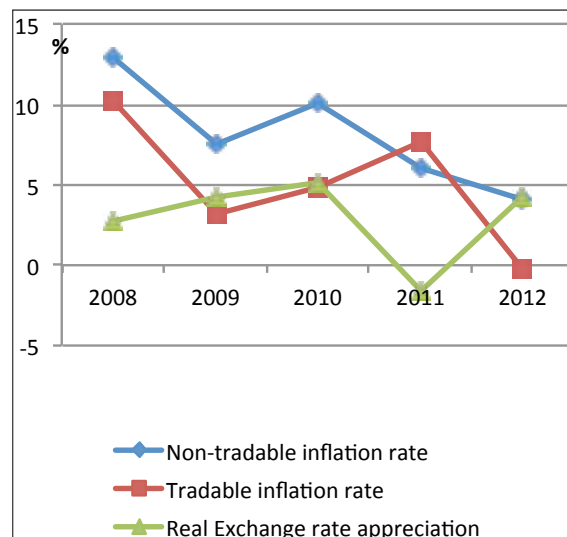
Source: NSO Data

commercial agriculture, fishing and forestry has fluctuated over the past decade due to volatility in commodity prices, declining from 8.1 per cent growth in 2011 to 0.2 per cent in 2012, due to poorer growing conditions and a stronger exchange rate, which consequently lowered the income of farmers and exporters.

Inflation rates, which have been quite high since 2000, fell from 8.5 per cent in 2011 to 4.1 per cent in 2012 (see Figure 4.4). This was partially due to changes in the value of the national currency (PGK), in addition to government policies and programmes such as the tariff-reduction programme in 2011-2012, which lowered

prices for imported goods, and the education programme introduced in 2012, which expanded the tuition fee subsidy and hence decreased the cost of education. Nonetheless, the inflation rate is forecasted to increase to 6.5 per cent in 2013, and 7.5 per cent in 2014 in response to the government plans to raise the import tariff in 2013, after several years of import tariff reductions. There is excess liquidity, in general, in PNG's commercial banks;

Figure 4.4 Tradable and non-tradable inflation rate and real exchange rate appreciation



Source: NSO Data

despite the efforts of the Bank of PNG to address this by raising the cash reserve requirements and other conventional monetary policy instruments.

For most of the period from 2001 to 2014, the government has adopted an expansionary spending policy, focusing an expansion of expenditure in areas critical to human development such as health, education, and priority infrastructure, on the basis of anticipated revenues from extractive sector projects. Government expenditure increased steadily in real terms and as a share of GDP from 2001 and, after a decline in 2009 and 2010, has again increased since 2011.



Central Business District, Port Moresby

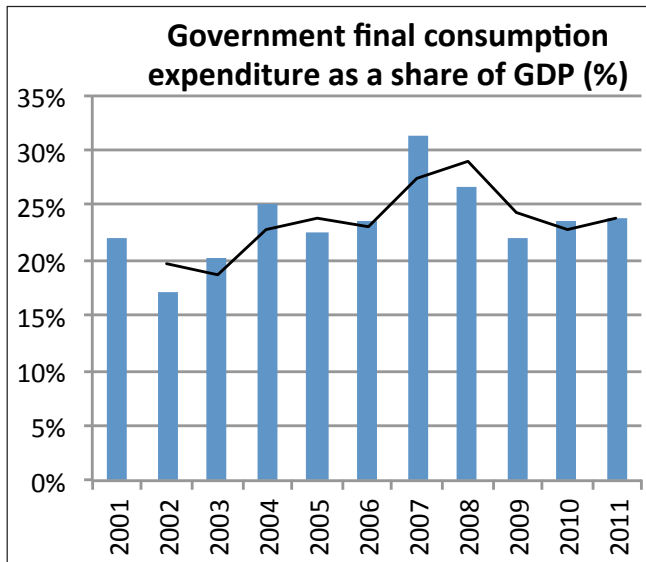


Figure 4.5 Government final consumption expenditure as a share of GDP (%)

Source: NSO Data

Despite this rise, government expenditure as a component of GDP has continued to fall short of its 2001-2007 levels, as investment (gross capital formation), driven by the PNG LNG and other extractive industry related projects, soared to 34 per cent of GDP, up from 9 per cent in 2006, signalling a greater degree of resource-dependence for the economy.

The budget balance turned from a surplus of 2.4 per cent of GDP in 2011 to a deficit of 1.2 per cent in 2012. The fall in the budget balance reflects lower revenue than expected, as a consequence of the declines in the commodity prices and overspending, mainly linked to the national elections in 2012. However, the 2013 budget indicated a change in the policy and spending strategy compared to recent years, as spending was increased by approximately 25%. The budget deficit is expected to reach 7.2 per cent of GDP in 2013 and 5.9 per cent in 2014, making the 2013 deficit the second largest since 1990. As budget deficits are mainly financed through domestic borrowing, government debt is expected to reach 35 per cent of GDP by 2014, which is now expected to remain around this level into 2015. These budget deficits are made on the assumption that proceeds from PNG-LNG will re-establish a balance in 2017 (World Bank 2013a).

In terms of trade, the current account has shifted from a positive balance (surplus) in 2008 to increasing large deficits from 2009 onwards. The current account balance deficit reached almost 50 per cent of GDP in 2012, before shrinking to less than 30 per cent of GDP in 2013 (IMF 2013). The growth in the deficit has been caused by higher imports, due to the construction of the LNG project, and a flattening of agriculture and mining exports. Exports have also been affected by the appreciation of the PGK and lower international commodity prices. However, the current account

deficit is expected to fall further to 8.4 per cent of GDP in 2014, as lower LNG capital imports and initial gas exports will reduce the trade deficit.

Overall **this analysis points to the significance of the extractive sector to all parts of the economy** – foreign investment, trade, and fiscal situation and prospects. The economy has grown significantly over the past decade and this growth is expected to continue – beyond a spectacular year in 2015 – for some time, albeit at a lower rate. The resource-based nature of the economy, balanced by the limited employment connected to the sector and the moderate, rather than overwhelming, contributions of the sector to GDP and government revenues, is discussed further below. For the bulk of the population, subsistence based agriculture and fisheries, informal trade, commercial agriculture and public and non-mineral private sector employment are more important in terms of livelihoods than the extractives sector.

### 4.3 POVERTY, HARDSHIP AND EMPLOYMENT

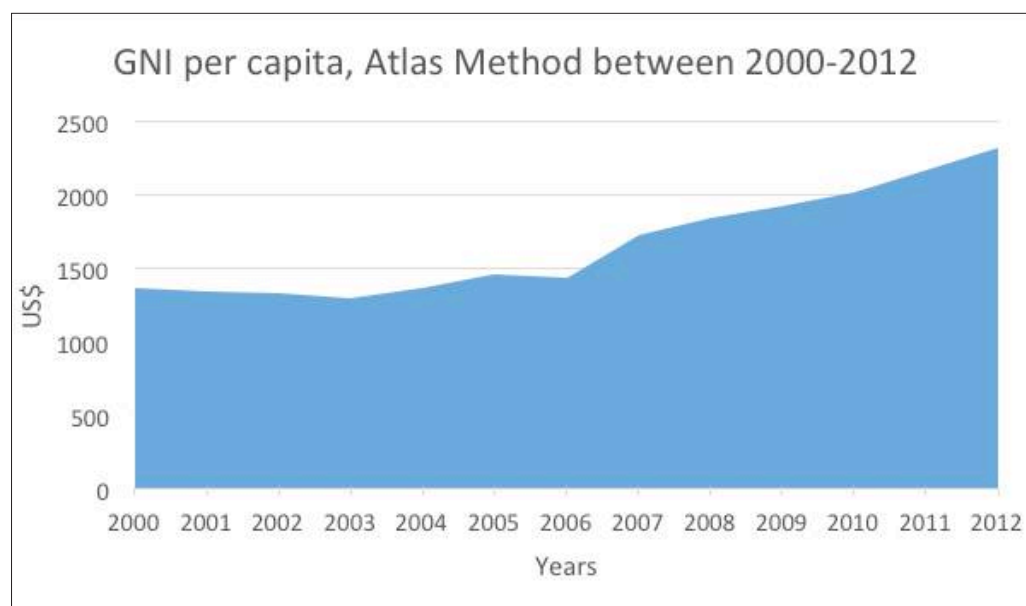
Despite a booming economy and vast reserves of natural resources, income and human poverty persist in Papua New Guinea. The majority of the population lives in areas with poor infrastructure and often rugged terrain, which gives them little or no access to basic services, such as health, education, sanitation and safe drinking water. The majority's dependence on subsistence rain-fed agriculture also raises levels of vulnerability to natural disasters and changing environmental conditions. Insufficient income opportunities and high levels of crime and violence further exacerbate hardship and inequalities. The term poverty is contested in Papua New Guinea policy circles, as the abject poverty found elsewhere in the world is largely absent, or masked by people's

*“The future that I want as an individual and for my beautiful country is to have better infrastructures and a more advanced technology, to have better monetary policies, reduced mortality rates, better education, better economic activities that would cater for more job opportunities for youths and finally reduction in poverty”*

LAMBERT SIMBA, 19 YEARS OLD

on-going connections to land and subsistence food production. But income poverty and poverty of opportunity are challenges for many in Papua New Guinea, particularly in rural areas.

Figure 4.6 GNI per capita, 2000-2012



Source: NSO Data

While per capita GNI and GDP grew steadily in real terms (Figure 4.6), weak connections between the formal extractives based-economy and the rest of the economy, along with poor economic governance and the absorption of a portion of financial benefits by foreign investors and contractors, **have limited the largest portion of society from reaping the benefit of this growth**. This, in turn, **deepened the degree of inequalities amongst population groups and geographic locations**. As a result, urban centres, particularly Port Moresby, Lae and Mt Hagen, have benefitted, whereas some rural areas and already more marginalized population groups including many women, youth, elderly and disabled people have arguably benefitted less ('The Future We Want', UNDP 2013).

According to the preliminary analysis of the 2009/10 Household Income and Expenditure Survey (HIES), at the national level the proportion of the population living below the basic needs poverty line (BNPL) rose from 34 per cent in 1996 to 36.2 per cent of the population in 2009/10, meaning approximately 2.43 million people were living in hardship. While the 2009-2010 analysis is not directly comparable with 1996 survey, when the poverty figures are adjusted to account for these differences, there is still no evidence of any significant reduction in income poverty over the 15-year period (1996-2009/10) (Gibson 2013). In the Islands region, and in Port Moresby, poverty appears to have increased in 2009 compared to 1996.

*The largest portion of society has been limited from reaping the benefit of economic growth.*

The incidence of food poverty was estimated to be around 26.5 per cent of the population in 2009/10 (see Table 4.2 below), which is high by Pacific standards. It is often thought that the incidence of food poverty is usually low in the Pacific region due to widespread subsistence agriculture and access to land under the customary land system that still prevails in many parts. While the incidence of basic needs poverty was estimated at 24 per cent of the population in urban areas, it reached 38 per cent of the population in rural areas. Unexpectedly, in rural areas, where access to customary land should lead to lower incidence of food poverty, the rate of food poverty was estimated at 28.5 per cent of the population compared to 14.4 per cent of the population in urban areas.

Table 4.2 Poverty measures for Papua New Guinea

Proportion of the population below			
	Food Poverty Line	Basic Needs Poverty Line (Lower Poverty Line)	Upper Poverty Line
PNG	26.5%	36.2%	39.9%
Urban	14.4%	24.3%	29.3%

Source: HIES 2009-2010

Table 4.3 Distribution of poverty by economic activity

Distribution of poverty by economic activity			
	Food Poverty Line	Basic Needs Poverty Line (Lower Poverty Line)	Upper Poverty Line
PNG	26.5%	36.2%	39.9%
No activity	29.8%	42.2%	44.5%
Wage earner	17.1%	25.1%	28.4%
Self-employed (own account)	29.5%	39.2%	43.5%

Source: HIES 2009-2010

The geographic disparities between the urban and rural incidence of income poverty masks deeper geographic disparities within urban and rural communities, an issue discussed in the following chapter. The highest incidences of poverty are among people with no income generating activities, and the self-employed in the semi-subsistence agricultural sector, as well as market vendors and others working in the informal economy, such as small producers/sellers (Table 4.3). The striking similarity in terms of the high incidence of poverty between those with no income generating activity and the self-employed in the informal economy, compared

to the significantly lower incidence among wage earners, suggests that one of the major determinants of poverty in Papua New Guinea is access to formal sector employment.

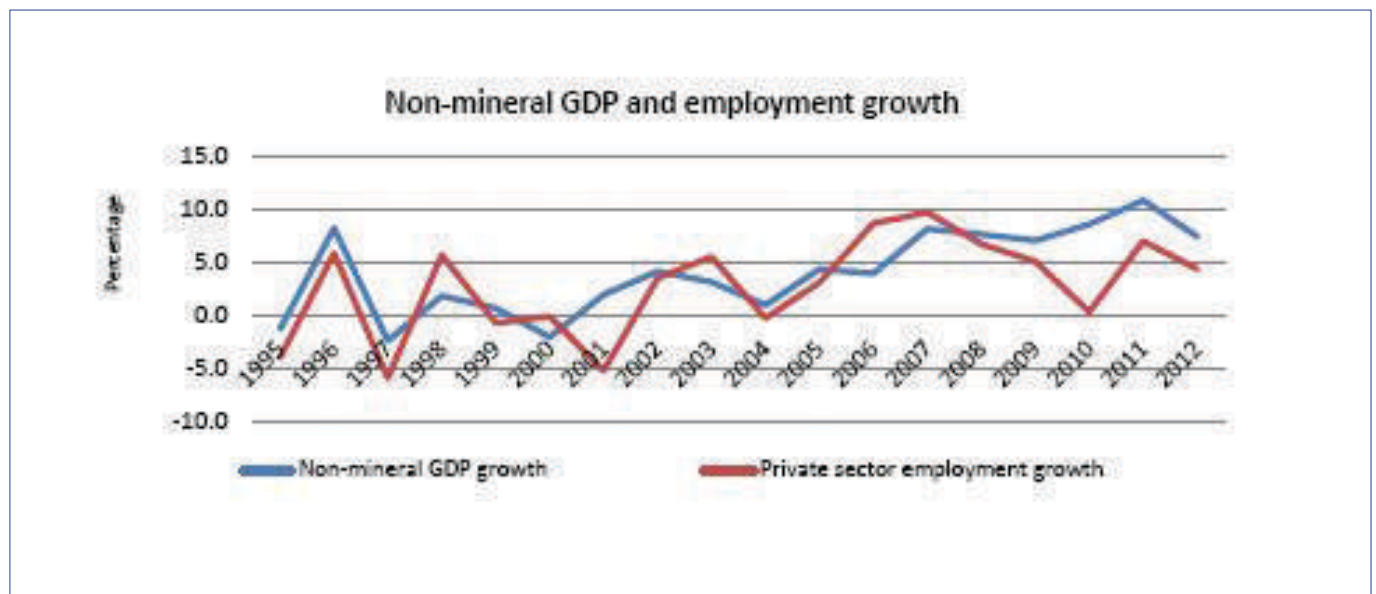
It is important to note that the poverty map and the characteristics of the poor in Papua New Guinea have not changed greatly between the 1996 and 2009-10 surveys. This can also be attributed to the extent and nature of the inequalities at the time of the 1996 survey and the structure and composition of subsequent extractives-led economic growth, as well a lack of economic policy to directly address inequalities and poverty.

Official figures show that Papua New Guinea presents surprisingly high levels of employment to population ratio<sup>16</sup>, with an estimated adult employment rate at 97.4 per cent in 2011 (NSO 2011): the comparable figure from the 2009/2010 HIES was 61.6 (HIES 2009/10). These figures however, include subsistence as employment, and hence are not reflective of 'productive and decent employment'. Consequently, in Papua New Guinea, most 'employed' people lack regular cash incomes. In terms of the formal labour market,

despite the mid-1990s recording 4 successive years of economic growth in excess of 10 per cent per annum (largely the result of new mining and oil operations), formal employment growth was much more limited over this period. This was largely the result of a combination of political instability, fiscal indiscipline, and mounting public debt that eroded private sector confidence, all of which worked to deter further investment. By 2001, the share of the working age population able to access formal employment had fallen to less than 10 per cent (Figure 4.7 below) (ADB Pacific Economic Outlook July 2014).

<sup>16</sup> The proportion of a country's population in employment. (The working-age population is commonly considered to be from 15-years onwards).

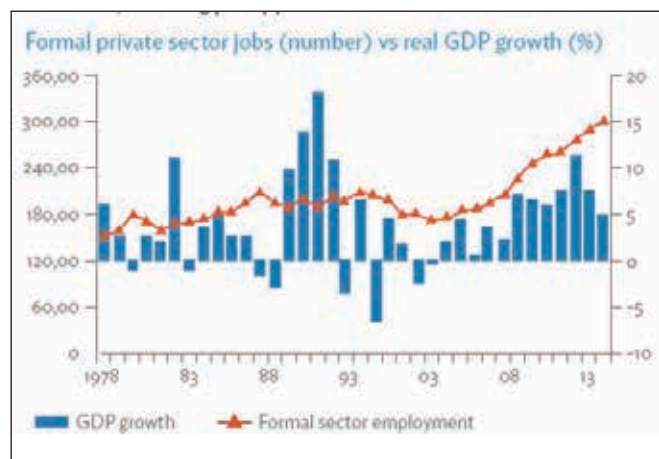
Figure 4.7 Non-mineral GDP and employment growth



Sources: Bank of Papua New Guinea. <http://www.bankpng.gov.pg> (accessed 20 February 2013); Papua New Guinea Department of Treasury. 2012.

In the last decade, formal sector employment growth in Papua New Guinea has been much more sustained (see Figure 4.8), and while investment in new extractive industries has been of direct importance to this (the PNG LNG project itself peaked at a workforce of 21,000), the growth has been diverse in terms of employment-generating sectors. The ADB (2014) reported that based on official statistics, 'agriculture accounted for the largest share of net job creation (30 per cent of the total), followed by manufacturing (21 per cent), building and construction (16%), wholesale and retail trade (15 per cent), transport (8 per cent), and finance and business (5 per cent)'. As the highest levels of

Figure 4.8 Formal private sector jobs (number) vs real GDP growth (%)



Source: ADB Pacific Economic Monitor, July 2014

investment have already been realized in the LNG project, the construction of the project has been slowing down in 2012 and

2013, subsequently also reducing the employment opportunities in this sector.

Overall the large growth in the number of job opportunities in the formal private sector in the last decade has done little to provide employment opportunities for the bulk of the rapidly growing population (see Figure 4.8). Job creation in the formal sector – widely recognized as an important way out of poverty – has been limited, both in terms of numbers of jobs created as well as particular groups of people that it benefits. For example, evidence suggests that women have generally benefitted less than men from formal sector employment. As discussed earlier (Box 2.2), the extractive sector does not itself create significant numbers of jobs.

Papua New Guinea's formal labour market remains small by regional standards despite a decade of rapid growth—providing livelihoods to less than 12 per cent of the working age population. A much larger informal labour market, centred on semi-subsistence agriculture, forestry, and fisheries, generates livelihoods for most of the remaining working-age population. Even with sustained growth in formal sector job creation, it will take decades to move a majority of the population out of the informal sector. Raising the living standards and levels of human development of those that rely on informal livelihoods will require stronger institutions that can provide the essential infrastructure and social services necessary to expand their access to markets and their ability to participate in the country's growing economy. Only in this way will the economic growth of the next decade be able to contribute significantly to more inclusive forms of sustainable human development for the people of Papua New Guinea.

#### 4.4 WHAT HAS BEEN THE CONTRIBUTION OF THE EXTRACTIVE INDUSTRIES TO ECONOMIC DEVELOPMENT?

The above review of the economy makes it clear that there has been a significant contribution of the extractives sector at the national level across several dimensions (exports, and to a lesser extent employment and GDP) for several decades, but that this has done little to reduce the extent or depth of poverty of opportunity among the population. It has also pointed to significant volatility, due to overlapping global, national and operation-specific sets of factors.

This section directly addresses the question of the contribution of the extractives sector, and it does so firstly at the macro-economic

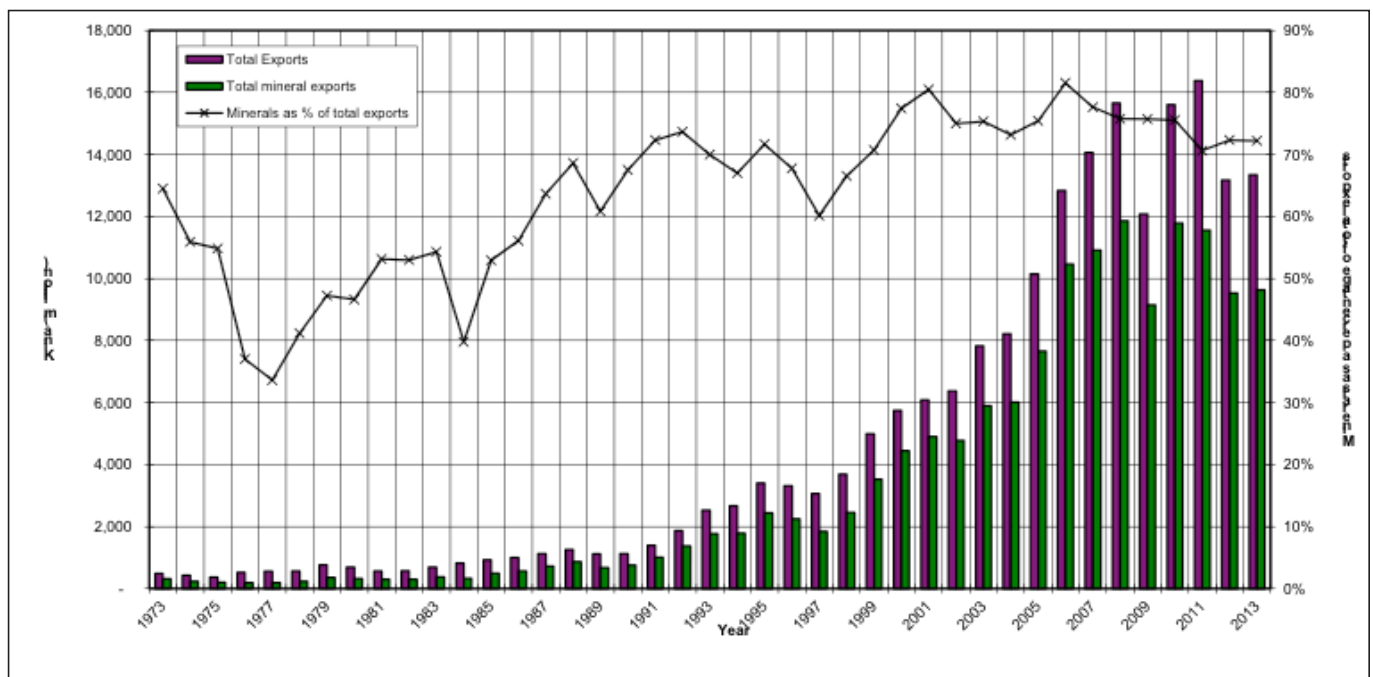
level in terms of exports, GDP, foreign investment, government revenue, and employment. Economic aspects of the contribution at provincial and local levels are then examined.

At the level of export contribution, Papua New Guinea is, and has been for decades, highly resource dependent. The outputs from the sector – copper, gold and oil until recently, and now nickel, cobalt and LNG as well – have made up over 70 per cent of total exports from the country (see Figure 4.9). This heavy dependence on a limited range of products gives a high degree of export concentration, with the United Nations Conference on Trade and Development (UNCTAD) (2012) showing a slight rise in the Herfindahl-Hirschmann index<sup>17</sup> between 2000 (0.3497) and 2010 (0.3674).



Lihir Resettlement Complex, 2010

Figure 4.9 Mineral exports as a proportion of total exports, 1973-2012



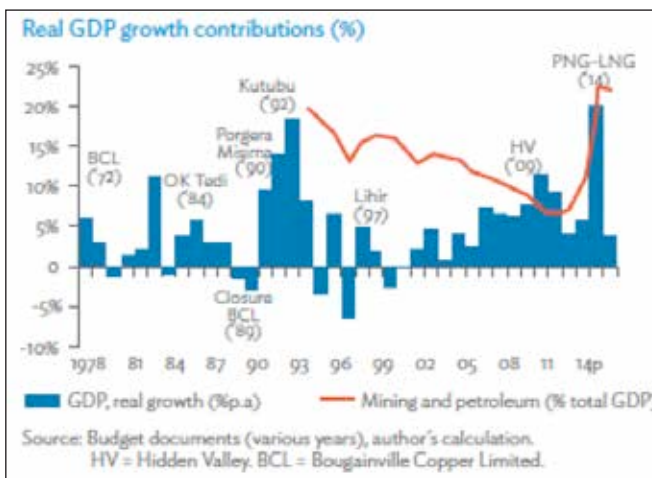
Source: BPNG statistics

<sup>17</sup> A standard economic calculation of export concentration that generates a normalized figure between 0 as the lowest and 1 as the maximum. The comparative 2010 figures for Botswana, Mongolia and Chile were 0.6720, 0.4895 and 0.3976, respectively.



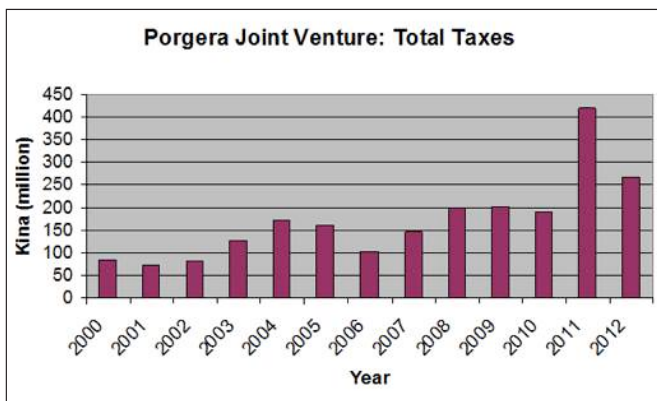
In terms of GDP, while the contribution is still significant, it is less dominant than for exports. In 2010 commodity exports (primarily minerals) equated to 61 per cent of GDP, a high figure in term of comparable resource dependent nations (the respective figures for Botswana, Mongolia and Chile, for example, were 27 per cent, 47 per cent and 30 per cent). The sectoral share of GDP accounted for by the extractives sector has fluctuated between 20 per cent and 30 per cent of GDP over the last decade (see Table 4.1 above), but will increase substantially with the onset of LNG production. Each of the extractive operations makes a contribution to GDP growth in terms of its construction and initial production, but this has been limited over the past decade, with depleting oil reserves and declining mineral output from the larger mines acting as a drag on growth (Figure 4.9 above).

Figure 4.10 GDP sectoral share, real GDP growth and extractive operations.



Source ADB 2014

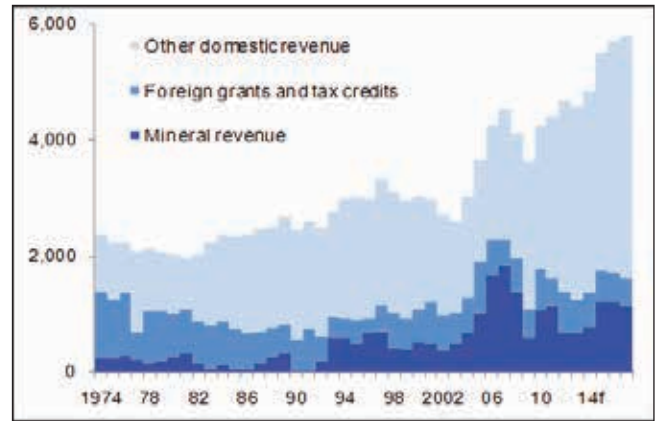
Extractive industries have delivered significant economic returns at the national level in the form of **taxes and dividends** to the National government, with around K19billion (US\$7billion in nominal terms) of corporate taxes, royalties and dividends on state shareholding accrued to the state since 1975 (see Figure 4.11 below). The fiscal regime that came out of the 1974 renegotiation of the original BCL agreement became embedded in legislation and was something of a model for developing countries at the time, incorporating an additional profit tax (APT) and utilizing a



Source: Porgera Joint Venture (PJV) data

Mineral Resources Stabilisation Fund (MRSF) to dampen down volatility in government revenue (O'Faircheallaigh 1984).

Figure 4.11 Government revenue by source, 1974-2017



Source: ADB 2014

As Figure 4.11 above illustrates, government revenue derived from the minerals sector has at times contributed up to a third of consolidated government revenue, although more significant is the obvious volatility of the sector's revenue flows to the government, in large part due to the financial performance of the individual operations.

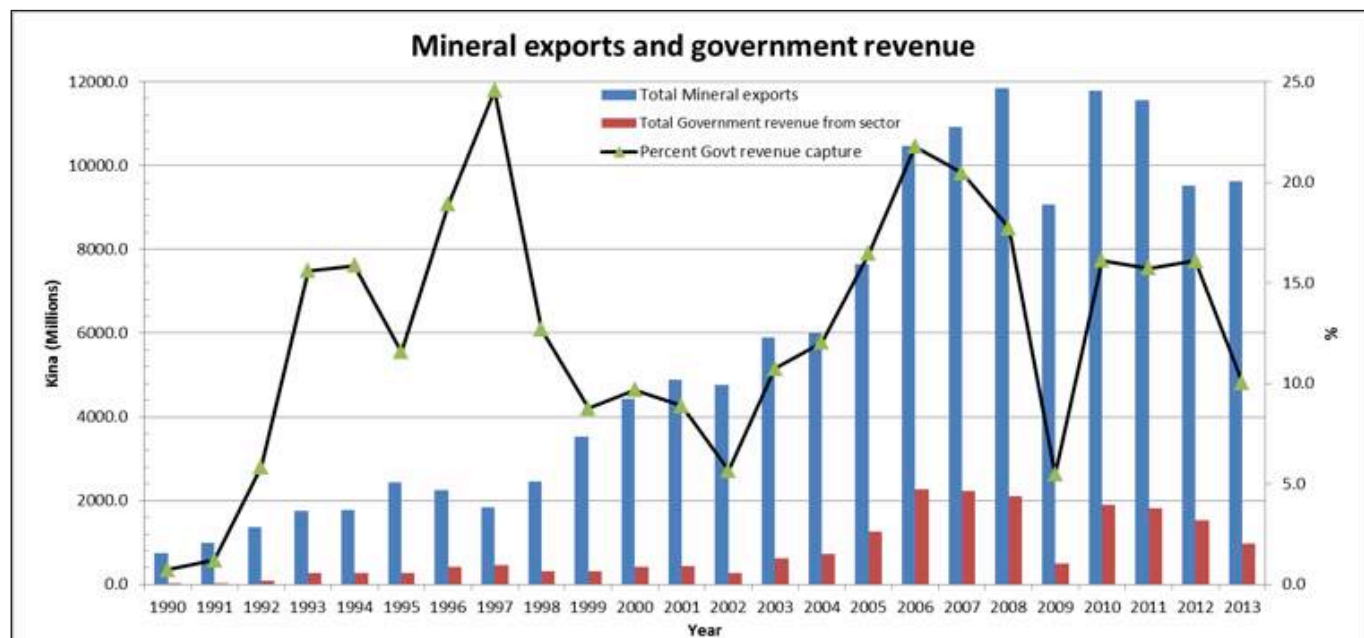
In terms of the specific mines, the economic contribution of the Ok Tedi mine has been particularly influential, with approximately K7billion (US\$2.5billion in 2014 terms) paid in income taxes, royalties and dividends to the national government over the 30-year period the mine has operated, the bulk of which accumulated between 2001 and 2010. However, tax contributions from extractive operations can fluctuate, due to variations in resource extraction, commodity price fluctuations, operational requirements, and the changing cost of inputs (especially fuel) (see Figure 4.12 for Porgera mine). In 2012 Oil Search (with the largest share of the current oil production) reported production of US\$725million (K1.45bn), with net profit after tax of US\$175million (K350million). Around US\$200million (or K400million) (approximately 27.5 per cent of total production) was paid to the government through taxes and dividends, with another US\$100million (K200million) in other payments, including royalties of \$25million (K50million) (Oil Search 2013).

Figure 4.12 Porgera Joint Venture: Total Taxes

In terms of the share of resource rents, the fiscal regime has directly captured around 12 per cent of the total value of the minerals exported since Independence (BPNG 2014). In the past decade this figure has been slightly higher (16 per cent) (see Fig 4.x below). Of the different elements of the fiscal regime outlined above, around 90 per cent of the returns to the government have come through Company Tax, with dividends received for state equity holdings in the different operations making up the bulk

PNG LNG project. While current policy allows the state to take up to 30 per cent in new mining operations and 22.5 per cent in new oil and gas developments, the state has ended up with a majority control at both Ok Tedi and Tolukuma. State holding in the other operations - particularly oil and gas - is complex, and the current plans to consolidate these holdings (under the Kumul Trust) may streamline this (IMF 2013). The pros and cons of state equity in these large developments are well rehearsed, both in Papua New

Figure 4.13 Direct Tax capture of the export revenue by the Government 1990-2013



Source: BPNG 2014

of the remainder. However, a combination of volatile commodity process and operation-specific medium- and short-term factors means there can be significant variations year on year, as well as variations between the contributions of different operations. For example, Ramu Nickel's 10-year tax holiday (negotiated directly by the State of PNG with the Chinese government), will give its tax payment schedule a very different timeframe from the other existing mines, with no tax receipts for the first decade of operations (IMF 2013).

State ownership in the resources sector is another factor that can influence the degree of return and control (as two separate issues) to the country (World Bank 2011). Until recently, all the major resource extraction processes in the country have been under the control of multinational corporations and interests (with a minority state and landowner share of all the major operations). These multinationals together constitute the bulk of the country's stocks of foreign investment in the wake of ExxonMobil's interests in the

Guinea since the 1970s (the State still holds a shareholding in Bougainville Copper Limited (BCL)), and internationally. Finding a balance between risk and return, the potential advantages of a fine-tuned fiscal regime and the opportunity cost of these significant investments in terms of foregone expenditure on other priorities, can make an assessment of the risks of such investments difficult. Most recently, a strong popular nationalistic sentiment – reflecting to an extent global trends – is arguably crowding out detailed analysis of the potential risks of this state equity participation by prioritizing political rather than economic interests.

From the point of view of managing the economic effects of the sector so as to deliver sustained improvements in human development, managing the **volatility of the sector** is arguably the greatest challenge (a trend noted in terms of the Resource Curse, see Box 2.2). A World Bank (2010) analysis indicates that for most years in the last decade the lack of growth in the sector and reduced production across some of the mining and oil operations

meant the sector contributed little or even negatively to real GDP growth, as illustrated in Figure 4.1 above.

This volatility of the sector makes Papua New Guinea as a resource-dependent country more vulnerable to price fluctuations. The graphic (Figure 4.14 below) (World Bank 2013) shows that the country's trade balance was disproportionately affected by commodity price drops over the period 2012-2013. Papua New Guinea is comparatively more exposed to price volatility, due to the export concentration around a limited range of commodities, than many other resource-dependent developing countries.

There have been attempts to manage this volatility in flows to the government, originally through the Mineral Resources Stabilisation Fund (MRSF), and more recently through attempts to quarantine flows in trust accounts and the use of 'windfall' rents during the boom to pay off public debt. The MRSF, established in 1974, originally operated by quarantining resource revenues domestically under rules that specified maximum annual drawdowns of extractive-derived government revenues, but these were gradually relaxed due to political and fiscal pressures and the effectiveness of the Fund largely disappeared. In 1999, the remaining balance was drawn down to retire around 25 per cent of short-term domestic government debt.

This resource dependency may increase further with the LNG project. This emphasizes the urgency to connect policy for the sector with the translation of the economic returns into improvements of levels of human development of the population, if the country wants to achieve the goals laid out in the national

Vision and policy frameworks. The proposed Sovereign Wealth Fund (SWF) (as discussed in Chapter 7) is designed in part to work towards improved management of these volatile resource flows.

In economic terms the downstream linkages of the large-scale mining projects are most significant at the national scale. Porgera, for example, has issued contracts to national firms worth K1.2billion (approximately US\$400million) over its life, while Ok Tedi has made purchases from Papua New Guinea firms of over K3.5billion over the last decade. Contracted services have provided the foundation for the growth of a significant number of local firms, including the now-nationally significant local landowner companies from Ok Tedi (Star Mountains), Porgera (IPI) and Lihir (Anitua) (see Box 4.1 below). In large part the success of these businesses has been built on local content or preference clauses built into mine development contracts (MDCs) and agreements, from which they have been able to leverage a more diversified business model. IPI for example, had revenue in 2009 of \$A29million, including \$A1million from its Australian business interests, and just 40 per cent of its revenue was derived from PJV mine contracts (Johnson 2012). Likewise, Landowners Companies (LanCos) have been recipients of a significant share of contracts associated with the oil projects: more than \$US230 million in the last four years (Oil Search 2013), while the PNG-LNG project recorded LanCo spend of K2.72billion during the construction phase of the project (ExxonMobil 2014).

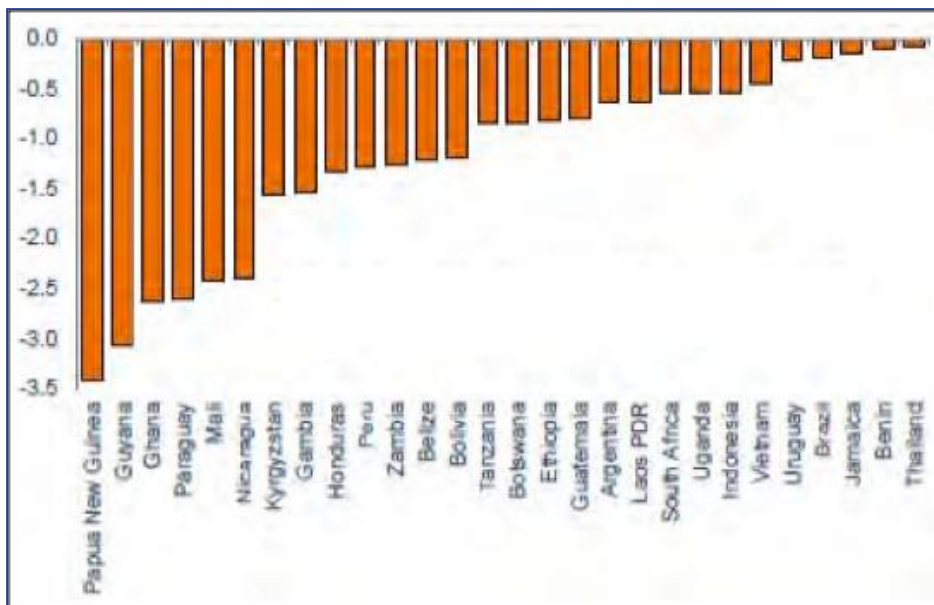


Figure 4.14 Impact of drop in global commodity prices on national economies (as per cent of nominal GDP)

Source: World Bank 2013

## BOX 4.1: LOCAL CONTENT

One of the real successes of the Lihir operation has been the development of local contracting capacity, and the growth of landowner business interests. Anitua, the local landowner umbrella business company, with shareholding from the six main landowning clans and the business arm of the LIG, is now a significant national company, employing 1,500 people on Lihir and another 2,000 at its operations (especially catering through National Catering Services) elsewhere in the country.

Like the other extractive landowner companies, Anitua was instigated to take advantage of the local content provisions of the agreements negotiated at the Development Forum prior to the start of the mine. These clauses essentially specified that subject to cost, and so long as the contractor was able to carry out the work, contracts related to the mine development should in the first instance be awarded to local contractors, and then national ones, and finally, if there were no Lihirian or Papua New Guinean firms available that could complete the work, to international firms.

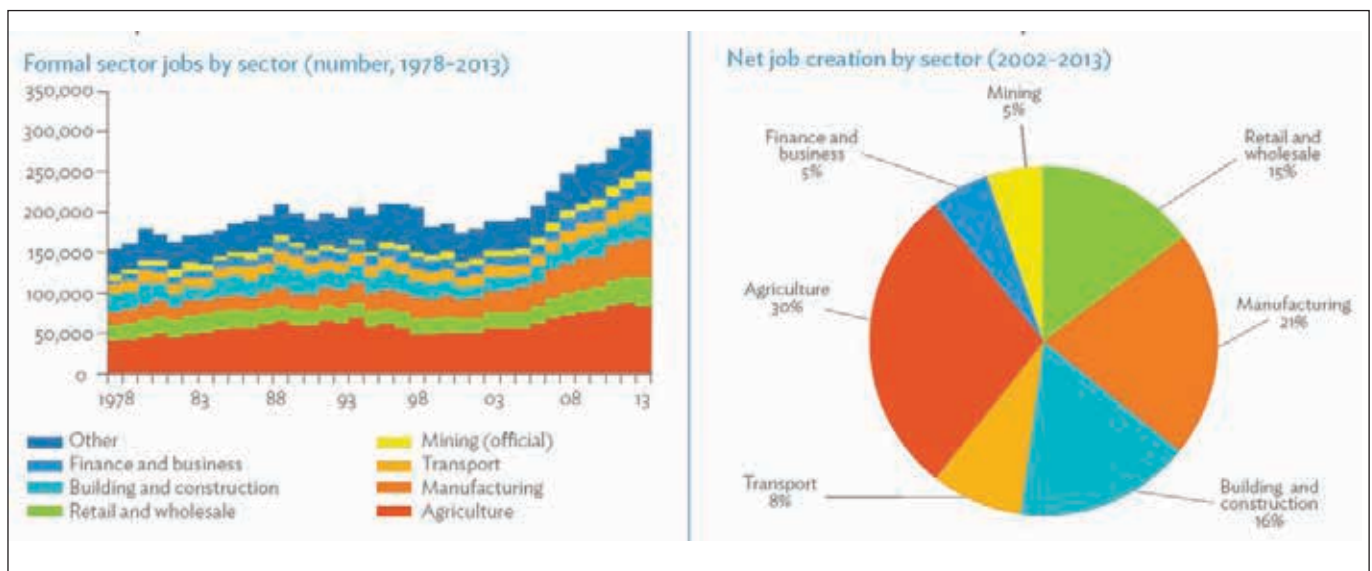
In the early stages of the Lihir development – as in the case of Porgera and Ok Tedi – Anitua secured a significant number of large contracts (usually in joint-venture with a national or international partner) in areas such as plant hire, catering, and security. There were problems with capacity, over-reach and management in the early years, but in recent times the group has established a diverse range of activities, many still linked to the company's origins: catering, mine services, construction, IT and training.

Source: Anitua 2014

As identified in Box 2.2 the extractive industries are not significant employers. The bigger mines are the largest employers, with an estimated 30,000 formally employed in the sector. Each of the large mining projects directly employs over 2,000 staff and similar numbers of contractors (Filer et al 2012). In this sense, the sector provides no more than 10 per cent of the formal sector employment. The PNG LNG project provided a significant number of jobs in recent times during its construction (peaking at 21,200 in 2012) but this number has declined dramatically as the project moves into production. Again, local preferences clauses ('preferred area policies') and requirements for gradual localization of the

workforce in the Mine Development Contracts for each of the major operations reflect industry best-practice. As noted in Box 4.1 above the development of locally owned contracting and service delivery companies also generates considerable employment: on Lihir, Anitua almost employs as many locals as Newcrest, the mining company. The bulk of this employment for Papua New Guineans is unskilled, although as the industry has matured an increasing number of Papua New Guineans are occupying professional and managerial roles within these companies and indeed several hundred have found employment in professional roles in the extractives sector in other countries (Filer et al 2012).

Figure 4.15 Formal sector jobs by sector (number, 1978-2013) and Net job creation by sector (2002-2013)



Source: ADB Pacific Economic Monitor (2013)

One of the more contentious elements of the contracting environment is that contractors engaged in the industry are rarely held to the same conditions of local preference as the mining company itself, and this can generate social tensions.

Given their size in the national economy, it is no surprise that the different operations dominate the economy at the level of the province they operate in. Enga Provincial Government (EPG) has received, for example, K275million from the Porgera mine (in the form of royalties, dividends and a Special Support Grant (SSG) negotiated with the National Government) (Johnson 2012). Significant revenue flows to the host provinces have been attached to the producing oil fields, predominately from 1) the royalties (set at 2 per cent of the value of production) and 2) business contracts to local companies. The former have netted around \$US500million, shared between Provincial government, local landowners, and a 30 per cent share to a Mineral Resources Development Corporation (MRDC)-managed Community Infrastructure Trust Fund.

**of novel governance and delivery mechanisms developed.** A significant developmental revenue stream largely at the provincial level, although not in the control of the province, has been the Tax Credit Scheme (TCS) (see Box 4.2).

The local economic effects of these large operations can be significant, and can transform communities that had previously operated at the fringe of the cash economy into major regional economic centres. A significant part of this transformation is related to the compensation and benefit packages (now labelled as Benefit Sharing Agreements (BSAs)) that are negotiated at the Development Forum. The compensation regime for damage to or loss of crops, forest and structures (from houses, to fences and gravesites) is typically based on a formal list from the Government's Valuer-General, although often tweaked to suit local circumstances. Royalty shares and other direct economic flows to community are more open to negotiation between the developer,

## BOX 4.2: THE TAX CREDIT SCHEME

This was established in 1992 after pressure from the resource companies (especially Porgera) who were concerned that there was little to show at the provincial level for the significant revenue flows that their respective operations had generated for the State. The scheme provides for companies to apply 0.75 per cent (initially 2 per cent) of their gross taxable income to approved infrastructure and other development initiatives, against which they received a credit on their corporate income tax. Management and implementation of these projects rested with the company itself, who were required to keep overheads associated with managing the scheme to a low level. Initially the focus was to be projects within their own province (and not in the immediate vicinity of their operation), but this has shifted through time and the Tax Credit Scheme (TCS) has funded regional initiatives (upgrading of the Highlands Highway) and some national projects. The amounts vary between operations, and from year to year. In 2004, for example, the Porgera Joint Venture (PJV) spent K70million and Ok Tedi K19.25million. Between 2009-2011, the three largest companies averaged TCS spending of K60million each.

*Sources: Callan 2013*

Extractive operations also increased revenues to the respective provincial governments that hosted extractive operations. National Economic and Fiscal Commission (NEFC) figures show that Western, Enga, Southern Highland and New Ireland Provinces (host to the major resource operations) receive greater revenue flows than other similarly sized provinces (NEFC 2013). As discussed in the following chapter, there is little evidence that this has produced more rapid improvements in human development in these provinces. At the same time **there has been a range**

the State and the landowners (the State's royalty share, for example, is typically divided between provincial and local level governments and landowners). The local economic effects of the Porgera gold mine (see Box 4.3 below) is typical of these local transformations, in offering the potential for significant improvements in financial and livelihood possibilities for communities. Much of the evidence suggests, though, that these significant revenue streams do little to promote sustainable improvements in human development for local communities.

## BOX 4.3: LOCAL ECONOMIC EFFECTS

The local revenue flows from the Porgera mine have been significant for an extended period of time (25 years). Between 1990 and 2009, Porgerans had received K597million (US\$200million) in compensation, wages, dividends and royalties. In 2009, this figure was around K56million, averaging K3935 per Porgeran resident, or K2195 across the population, including a significant migrant population. At different times, compensation and wages have vied as the largest flows: in the early years of construction, compensation was much more significant, but as the operation matured, royalties and then particularly wages took on greater significance. Wages currently make up 60 per cent of the revenue stream that goes to the local Porgeran economy.

In addition, there were significant contracts and business development opportunities made available to Porgerans, with the value of local business contracts between 1989 and 2009 being in the order of K400million. However the actual value to the local economy is typically limited due to poor financial management skills and the high costs associated with businesses in remote parts of Papua New Guinea (Johnston 2012).

*Source: Johnston (2012) and Banks (2007).*

The very large sums of money made available by the government as Infrastructure Development Grants and Business Development Grants (1.32billion over 10 years) under the various tiers of negotiated Benefit Sharing Agreements (BSAs) for the PNG LNG project (see box 4.4 below), and the significant value of local (Landowner company – LanCo) construction contracts (an

estimated K2.7billion), have all sparked massive local economic changes in the areas adjacent to the facilities. Contests over access to these revenue streams that have extended to provincial and national levels also occurred. In addition, significant compensation and resettlement packages (although no precise figure is available, it is in the order of K50million) associated with

## BOX 4.4: THE PNG LNG UMBRELLA BENEFIT SHARING AGREEMENT (UBSA)

The State concluded negotiations in a Development Forum with the PNG-LNG project in May 2009 over the terms of an over-arching Benefit Sharing Agreement (BSA) for the project. In terms of the direct revenue flows, the BSA includes:

**Royalty:** A royalty benefit of 2 per cent paid to the State is to be re-distributed to landowners, affected provincial governments and local level governments. The landowner share of the royalties are to be divided between a cash component (40 per cent), an infrastructure trust fund (30 per cent) and a future generations trust fund (30 per cent). Royalty is calculated on a 'wellhead value' basis per the terms of the Oil and Gas Act.

**Equity:** The UBSA provides a total of 2.8 per cent free equity participating interest in PNG-LNG to Project area landowners and local level governments. The UBSA also provides Project area landowners and provincial governments with the opportunity to buy into indirect PNG-LNG equity up to a collective maximum of 4.2 per cent between 1 January and 30 June 2016.

**Development Levy:** A Development Levy of 2 per cent of the wellhead value, calculated per the provision of the Oil & Gas Act and the LNG Gas Agreement, is available to the provincial governments and the local level governments.

**Infrastructure Development Grants (IDG):** An amount of K1.2billion has been allocated by the State equally over two five year periods, commencing in 2010 for infrastructure development and maintenance in the affected Project areas and provinces.

**Business Development Grants (BDG):** The State has provided K120million to assist landowner companies in business development activities under the PNG-LNG Project.

The division of these benefits among the various local stakeholders was then subject to negotiations that resulted in a series of local 'Licence Based' BSA's, agreed in December 2009.

*Source: PNG LNG website (<http://pnglng.com/commitment/hot-topics/benefits-sharing>)*

the PNG-LNG project have contributed to these processes of local change in ways similar to those recorded for the nearby Kutubu oil project (Gilberthorpe and Banks 2012).

*“The future I want is to have freedom, peace, harmony and equalism in the country so there won’t be any conflicts or difficulties among the citizens”*

SERAH MORA, 19 YEARS OLD

The major revenue flows to communities raise three main issues in terms of human development. First, it is clear that the flows contribute significantly to local level incomes and livelihoods. In a human development sense, opportunities have increased for many (though rarely for all) in the affected communities, although in the case of many of the revenue streams (compensation, wages, royalties etc) they are only available over the life of the operation (10-30 years typically) and to particular groups such as relatively small numbers of landowners and their families. ExxonMobil, for example, have specifically targeted livelihood projects for resettled communities around the PNG-LNG facilities that are focused on expanding economic opportunities and livelihood options for women (see Box 4.5 below). In these examples, and with the local-level flows generally, there is clearly a series of personal positive effects, but what is needed is to connect or scale up these initiatives to broader institutional levels to ensure their sustainability. This would also facilitate greater integration with existing government and donor-funded development efforts.

Crucially, though, there is evidence that these available revenue flows are not used by most landowner recipients in ways that promote sustainable improvements in their (and their community’s) human development. There is often a lot of ‘conspicuous consumption’ (vehicles, travel), and local spending patterns that promote alcohol sales and prostitution, as well as investments into traditional forms of exchange – compensation and brideprice contributions, for example (Banks 2005, Bainton and Macintyre 2013). At the Porgera mine, the bulk (65-75 per cent) of the mine-derived compensation had been directly consumed or re-distributed and consumed, or redistributed to relatives outside of the valley (Banks 1999a). This appears to be at least partly a consequence of these revenue flows being seen as ‘money rain’ – money that falls from the sky as ‘unearned’ resource rents. The gender and generational dimensions of these ‘windfalls’ require more research.

Second, these economic flows – the much sought after ‘benefits of mining’ – are themselves the source of many of the social and cultural problems that arise from these mining operations. They are discussed in the following chapter, but two economic effects of these local flows can be distinguished: disputes over access to and distribution of these extractive industry revenue flows can (and regularly does) generate conflict, and inequality in communities can increase dramatically. The critical factors that drive this growing inequality are status (lease landowner/migrant), gender, age and position within a community (many representatives and leaders have done far better economically than most in their respective communities, with significant business interests and investments in Papua New Guinea and offshore) (Banks 2005). There have been some moves to address the distribution of revenue flows (see Box 4.6), particularly in terms of securing a share for women and children, but the existing patterns of inequality are hard to break.

## BOX 4.5: LIVELIHOOD PROJECTS AND THE PNG-LNG PROJECT

ExxonMobil has invested significant resources in small-scale livelihood restoration and improvement programmes, many of them targeted at women in the local communities. Training in baking, financial management and agricultural production have opened up opportunities for women to get involved in the cash economy, and provided benefits to individuals, families and the broader community:

“This training has had a positive impact on the whole community,” says Shirley [Iragali, from Paua village]. “More and more women want to get involved and improve their skills. Now they have started their own businesses and many families are benefiting. When we develop ourselves, we develop the whole community and this is the change we are seeing.” And the change [is] well received. “The products the women are making taste good,” says Ben...

Source: PNG LNG (‘stories from the field’ Tok Tok January 2013, <http://pnglng.com/newsroom/publications/>)

## BOX 4.6: IMPROVING DISTRIBUTION MECHANISMS: CHILDREN'S TRUSTS AND A DIRECT SHARE FOR WOMEN

The original Porgera Development Forum in 1989 included a new agreement on the distribution of mine-derived royalties. As part of this, 10 per cent of the royalty stream is to be paid into the Porgera Special Mining Lease (SML) Children's Trust, to be used to support educational activities of children of the mining lease landowners. Similar trusts to receive royalty share have been established at the other major operations. In 1994, a revision to the Porgera royalty schedule also introduced a new category – SML Youth – for young people from the mining lease who were not eligible for Children's Trust funding. These payments have been made in cash.

The revised Community Mine Continuation Agreements (CMCAs) at Ok Tedi, concluded in 2007, provided women with a role during the negotiations and 10 per cent of all compensation monies, 50 per cent of all scholarships, cash payments into family bank accounts (to which many women are cosignatories), and mandated seats on the governing bodies implementing the agreement (including future reviews of the agreement). These entitlements were embedded as legally enforceable rights in the agreements signed by the state and the developer, a first for the sector worldwide. While some concerns have been raised about the implementation of these arrangements (with limited knowledge among male and female villagers of the agreements, limited impacts of the ring-fenced funding, and the lack of mandated representation on planning committees), this agreement has produced some significant improvements (particularly in terms of scholarship access) and is likely to have effects elsewhere in the sector as it marks a departure from existing, male-dominated, patterns of distribution.

Sources: Banks 2005; Johnson 2012; Menzies and Harley 2012.

Third, beyond records of the amounts paid into the communities there is very limited transparency around most of the local economic flows and processes. Local representative bodies and even public institutions at Porgera are particularly opaque (Johnston 2012, HRW 2012), and there is limited knowledge of how the funds received by communities are used (beyond the anecdotes of wastage and conspicuous consumption). Given the low levels of financial literacy in many of these communities and the limited capacity of local forms of government, this is not surprising.

### 4.5 SUMMARY

Papua New Guinea has witnessed impressive growth rates in the past decade, largely driven by resource extraction. The economic contribution of the sector has been the driver of the formal economy since Independence, and the sustained growth figures have had some positive contributions among some groups and in some locations (operational enclaves) for some aspects of human development. Overall however, the growth has done little to reduce the extent or depth of income poverty and hardship among the population as a whole. In fact, as noted above, in some locations inequalities appear to have risen with some groups benefitting significantly, and the majority missing out on significant gains.

Economic growth by itself, then, is not sufficient for improvements in sustainable human development. It has to provide benefits to people equitably and in a manner that does not compromise environmental sustainability. Maximizing the positive and minimizing the negative effects is, to a large extent, dependent on the policy environment towards managing natural resources, as this determines the pathways used to translate resource wealth into broad-based and sustainable development.

What this discussion of the economic contribution of the extractive industries to sustainable human development has underlined is the critical influence of national and sub-national governance in ensuring the application of resource rents to broad-based

*While livelihood improvement programmes can bring significant improvements for small numbers of people, it is really the ability of public institutions to translate the significant revenue flows into meaningful and sustainable improvements for the bulk of the population that is the key to unlocking the potential of the country's resource wealth.*

human development. While locally-focused corporate livelihood improvement programmes can bring significant improvements for small numbers of people, it is really the ability of public institutions to translate the significant revenue flows that are available into meaningful and sustainable improvements for the bulk of the population (at national, provincial and local levels) that is the key to unlocking the potential of the country's resource wealth.

Moreover, where not managed well, economic growth can undermine development gains, through creating social division, inequality, and environmental devastation, as well as by disrupting links between people and land (further discussed in the subsequent chapters). Both Bougainville and Ok Tedi have demonstrated clearly that there can be a huge economic cost caused by social and environmental instability. In this sense, while economic growth is a precondition for development, more sustainable and inclusive forms of growth become preconditions for sustained and stable economic growth (the economic case for inclusive growth policies).

The contribution of mineral wealth to social and environmental development in Papua New Guinea will be further examined in the following two chapters.



# CHAPTER 5

## The Contribution of Mineral Wealth to Social Development in Papua New Guinea

### 5.1 INTRODUCTION

The contribution of the extractives sector to the social elements of sustainable human development is the most ambiguous: on the one hand the revenue flows generated can fund improvements in health and education, infrastructure such as roads and ports, and the improved reach of government services. On the other hand (as noted in Box 2.4), at the local-level the impact of extractive operations can be devastating for particular communities and groups of people, in the extreme case leading to what Colin Filer (1990) refers to in the Papua New Guinea context as 'the process of social disintegration'.

This chapter addresses the question: **how have Papua New Guinea's extractive industries contributed – both positively and negatively – to inclusive and sustainable forms of social development.**

The chapter is structured around a brief description of core social development themes and trends – starting with population and then dealing with health, education and gender. Each of these sections provides firstly a description of their status in Papua New Guinea as it relates to human development, and then an examination of the effects of the extractive industries. The logic here is that the impact of the extractive sector occurs within a context of broader societal and developmental changes.

The final two sections – Development, Exclusion and Inequality, and Land, Culture and Conflict – address additional social elements that are critical to the links between extractive industries and sustainable human development, especially in the Melanesian context. Throughout the chapter the issue of scale is important, as it was for the economic dimensions, with the sections highlighting the different nature and extent of contributions at local, provincial and national levels.

In broad terms, the extractive industries provide many opportunities for improvements in the social aspects of human development. At the national level, the fiscal flows from the sector can be used to improve health and education. At local levels, there are potential positives – including improved health and education facilities, and various initiatives to support women and people living in poverty. Nevertheless, there exists also a range of potential negative social impacts on the affected communities, particularly in terms of conflict, social dislocation and disruption, and the compromising of human rights. Given the desire expressed in Papua New

Guinea's various policy frameworks to promote more sustainable and equitable forms of development, there is some urgency to put appropriate structures and policies in place to support these communities in the face of the LNG-led boom and the need to strengthen human development outcomes and rights. The private sector is an important partner in achieving this, but ultimately, it is the State and Government leaders (nationally and at province level) that bear the duty to promote levels of development and wellbeing for citizens.

### 5.2 POPULATION

The country's demographics will add a significant future burden on the Government's duty to provide services to its citizens. The 2011 National Census<sup>18</sup> shows Papua New Guinea's population was at 7,254,442. This is an increase of just over 2million people from 2000, indicating average annual growth of 2.9 per cent, which – albeit lower than for the period 1980 – 2000 (Appendix 3) – indicates that the population is likely to double by 2030. Life expectancy is growing and – by international standards – continuously high fertility rates outweigh high mortality rates (see also Health, below). As a result, the population is very young, with 40 per cent under the age of 15 (and a median age of 19-years (2000) . With around 20 per cent of the population living in the urban areas, Papua New Guinea is one of the most rural countries, with only Rwanda, Bhutan, Nepal and Uganda having a greater proportion of people living in rural areas.

#### Total Fertility Rate (children/woman):

5.4 (1980)

4.6 (2000)

#### Infant mortality:

58/1000 live births (2011 Census)

#### Life expectancy:

53-years (1980)

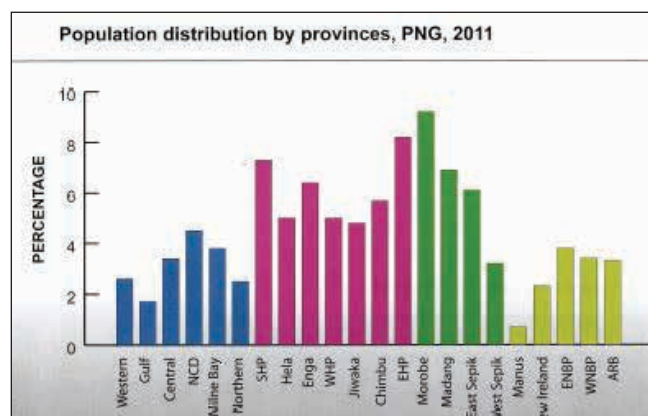
63 years (2012)

The population is unevenly spread among the provinces, varying from over 500,000 in Morobe to just over 50,000 in Manus Province (see Figure 5.1). The Highlands region had a significantly higher rate of growth (3.8 per cent) over the period 2000-2011 than the other three regions (2.0-2.3 per cent), which suggests that the region's existing demographic dominance is likely to continue to grow.<sup>19</sup>

<sup>18</sup> At the time this report was being finalized, there was a lack of detailed analysis of the 2011 Census and only limited results had been released that could show trends and processes at sub-national levels. This limited the scope for analysis of the effects of resource development on population (including migration and some measures of health and education) at sub-national levels. There are also some discrepancies between published official sources, and this also complicates both data analysis and policy development.

<sup>19</sup> This may be partly at least a reflection of methodological and boundary changes with the most recent census, as one of the two newly created provinces (Jiwaka) recorded the highest rate of growth (5.6%), a rate that would appear to indicate a population doubling time of around 14 years.

Figure 5.1 Population distribution by provinces, PNG, 2011



Source: NSO: 2011 census results.

These rates of population growth at provincial level are influenced by migration, as people move primarily to seek better opportunities for improving their standard of living. While a relatively small number of Papua New Guineans migrate overseas (the greatest number – around 25,000 – residing in Australia), there is a long history of migrants moving to areas and becoming incorporated into Papua New Guinean societies. Today the largest numbers of ‘expatriates’ are Australians, but the country is also home to increasing numbers of migrants from Asia including from China, Malaysia and Philippines. Patterns of internal migration – aside from rural to urban flows – are hard to discern from official figures. Appendix 3, shows no consistent pattern in provincial growth patterns over the past 30 years, including among resource rich and resource poor provinces: Port Moresby/NCD for example shows a dramatic decline in annual average population growth rates, 2.6 per cent between 1990 and 2000, although it did increase to 3.3 per cent in the most recent period. Resource rich provinces also show mixed rates – Enga for example, varied from 3.6 per cent, to 2.1 per cent to 3.5 per cent over the three periods, while relatively resource poor Chimbu recorded faster average growth over the last two periods (3.4 per cent). The 2009/10 HIES indicates that 29 per cent of the population lives in households where the head was born in a different Province to where they currently reside (although note the 2000 census figure is just 10 per cent: see Allen, Bourke and Gibson 2005).

These figures indicate that the effects of the extractive industries on population demographics are primarily local. Hence resource extraction drives significant in-migration to the site of these operations. While there is some variation by operation, in most cases in-migration is the most significant demographic factor. Detailed monitoring at Lihir has shown a fall in both fertility and mortality rates over time (see discussion under Health, below), but the largest influence on the demographics within the mine-affected community is through project-induced in-migration. At the local levels, there is a clear **‘rural to resource’ migration trend**. For example, in the Porgera LLG area there has been an increase from just over 10,000 people in 1990 (when the mine began), to 22,000 in 2000, to more than 50,000 according to the 2011 Census. People have come to access employment and other economic opportunities, or increased access to better health, educational or entertainment opportunities (Banks 2005). Other resource projects have had similar effects, although not quite as marked. This influx of people to areas immediately surrounding large-scale resources projects, much of it along kinship lines (see Bainton, in press) places a real constraint on the improvement of human development indicators for local populations: the migrants can place enormous pressure on local infrastructure (filling local

school rolls, for example), and are often implicated in the various forms of social dislocation and conflict that landowners experience (Bainton in press, Banks 2005). Social cohesion is typically stressed by these migrants, leadership and representation fragments, and environmental health – water, sanitation and living conditions – in the recipient communities deteriorates.

Substantial in-migration into the communities closest to the oil and gas developments (reflected in a 40 per cent increase in structures in the communities around the Hela Province project infrastructure between 2012 and 2013, Papua New Guinea Institute of Medical Research (PNGIMR) 2014) has also presented significant challenges to communities in terms of traditional exchange and leadership (Gilberthorpe 2012). The limited evidence available also shows that migrants tend to do better economically than the resident local population – both around resource projects (Banks 2005), and more generally. The 2009/2010 HIES, for example, shows that migrant households are 32 per cent less likely to be living in poverty than non-migrant households, due usually to better skills, entrepreneurial drive and willingness to work harder.

### 5.3 HEALTH

**The overall health situation in Papua New Guinea remains a cause for concern.** Although there are marked regional variations and some modest progress in terms of decreased mortality and morbidity (ill-health), the strong economic growth in Papua New Guinea has yet to translate into significant health status improvement for the population. This limited progress is supported by the health-related Millennium Development Goals (MDG) indicators, which demonstrate that Papua New Guinea is far from attaining the universal MDGs and is some way off many of the nationally-tailored 2015 goals (see Appendix 3). The lack of accurate and reliable health data and the absence of data from some remote areas of the country also affects the accuracy of the indicators.

*“I want Papua New Guineans to be educated and also to have more job opportunities. I also want the rate of infant mortality to fall”*

MARIA AGLAI, 18 YEARS OLD

This section reviews the health situation of Papua New Guineans highlighting the main causes of mortality and morbidity, most of which are linked to preventable conditions, and then describes the risks and challenges presented by the country’s health system. In this context the discussion and analysis then moves to the potential positive and adverse impacts of the extractives sector on health-related aspects of human development.

#### HEALTH STATUS

Papua New Guineans continue to primarily die from **preventable communicable and infectious diseases, and preventable pregnancy complications**. Malaria, TB, vaccine-preventable diseases and diarrheal/ water-borne diseases are among the top-five causes of morbidity and mortality. Each of these (along with maternal mortality, child and infant mortality, STIs, HIV, and Non-Communicable Diseases (NCDs) are briefly reviewed below in Table 5.1. The Table provides an overview of the status of the most significant diseases and health conditions; further discussion of the broad patterns then follows this table. In all cases, due to under-reporting, rates are estimated to be higher than indicated.

Table 5.1 Status of major diseases and health conditions

Pneumonia	Lower respiratory infection (pneumonia) continues to be the leading cause of premature death.
Malaria	<p>Although overall malaria incidence has declined markedly in the 2008-2012 period (18.2% to 6.7% population parasite prevalence), it has become endemic in every province, including the Highlands Region, which was once considered malaria-free (WHO 2011). It constitutes a significant burden on the health system.</p> <p>1.07million outpatient cases, 14,546 in-patient cases and 380 recorded deaths. The leading cause of outpatients visits, the fourth leading cause of hospital admissions and the third leading cause of death (Department of Health 2012).</p> <p>90.7% of population living in areas considered at risk of malaria</p> <p>50% of population live in areas with potentially high transmission (Pulford et al 2012)</p> <p>The national proportion of children sleeping under an insecticide treated bed net is 59%, and there are more male children under five years sleeping in treated nets than female children (Department of Health 2013)</p>
Tuberculosis	<p>The Government is committed to having a TB-Free Papua New Guinea by 2050, but significant resources will be required to achieve this.</p> <p>Although the capacity of the national TB programme has expanded in recent years (2008-2012), particularly in terms of diagnosis, TB remains a major challenge (Department of Health 2013).</p> <p>TB was the second cause of in-patient bed occupancy in hospitals in 2008</p> <p>Prevalence was 541 per 100,000 with a death rate of 26 per 100,000 and an estimated mortality (excluding HIV) of 54 per 100,000 per population, thus currently ranking 2nd in estimated TB burden in the Western Pacific Region (WHO 2013).</p> <p>Multi-Drug Resistance TB (MDR-TB) is estimated to be present in 4.9% (3.6-6.1%) of new cases and 23% (20-27%) of previously treated cases in 2012, which translates to about 590 new and 500 previously treated MDR-TB cases (WHO 2013).</p> <p>Directly Observed Treatment Short-course (DOTS) was introduced in 1997, but currently only reaches 9 (of 22) provinces.</p> <p>The National Capital District in particular is identified as the hot spot for TB with consistently high TB notification rates (4 times more than national average) and contributing to 25% of country TB burden despite hosting only 5% of the country's population.</p>
Cholera	A particular cause for concern is an outbreak of Cholera along the northern coast since 2009, due to poor water sanitation and poor hand hygiene associated with infection in peri-urban settlements. Control measures are also made difficult by the remoteness of some affected sites and by the often crowded settlements on the outskirts of cities with no proper sewage systems and deteriorated environmental health conditions (WHO 2010).
Maternal Mortality	<p>Although estimates vary – partly due to different methods utilized to calculate the ratio<sup>20</sup> – it is clear that the <b>Maternal Mortality Rate (MMR)</b> in Papua New Guinea is extremely high. The 2006 PNG Demographic and Health Survey (DHS) calculated the ratio at 733 per 100,000 live births, whereas the WHO/ UN Agencies/ADB/World Bank (2014) estimates 230 deaths per 100,000.<sup>21</sup> In any case, the MMR MDG target for 2015 for PNG, set at 98 cases per 100,000 live births<sup>22</sup>, will not be achieved. Overall, this is an indication of very poor and possibly worsening maternal health in PNG. Department of Health (2013) data indicates that the level of antenatal care has declined in the last 3 years in all regions, except in the Highlands region where it has slightly increased (Department of Health 2013). Shortage of skills and human resources, particularly obstetricians, midwives and trained birth attendants has been described as 'extreme', and so increasing the workforce is a top priority for the health authorities. Referral systems are either 'nonfunctioning or nonexistent' (Department of Health 2013). High MMR and overall poor maternal health have to be put in a broader perspective of women's health, linked to the low status of women in many PNG societies. Obstetric haemorrhage, sepsis and eclampsia are the main proximate cause of maternal death compounded by high anaemia often associated with malaria (Department of Health 2013). Although a majority of women received some Ante Natal Care (ANC) from a skilled health personal, on average only 53% of them deliver with the assistance of a skilled health care worker (rural: 48% and urban: 88%) and only 44% of births occur in a hospital or health centre.</p>

<sup>20</sup> The DHS 2006 ratio was calculated based on the "sisterhood method" which covers a range of time of about 12 years before the survey with a point in time of 6 years.

<sup>21</sup> The data is estimated with a regression model using information on fertility, birth attendants, and HIV prevalence.

<sup>22</sup> This target has been re-tailored for PNG under the National MTDS 2005-2010

Neglected Tropical Diseases (NTDs)	<p><b>Leprosy</b> is endemic in Papua New Guinea and the disease occurs in major pockets along the coastal, Inland and highland regions, and in the peripheral Islands. 14 out of 20 provinces maintained the elimination level in 2013.</p> <p>At the end of 2013, there were 650 registered cases with a prevalence rate of 0.8/10,000 population. 381 new cases were detected, mostly through voluntary reporting, with new case detection rate (NCDR) of 5.1/100,000 population. Among the new cases detected, 11 had disability grade 2 and 21% were children under 15 years old.</p>
Sexually Transmitted diseases	<p>The prevalence of <b>Sexually Transmitted Infections</b> (STI) is considered to be very high by global and regional standards. STIs remain a major challenge for the health authorities of Papua New Guinea, as increasing population movement, introduction of new pathogens, insufficient health services and wider and often denser socio-sexual networks engendered by rapid social change provide favourable conditions for their spread (Jenkins and Passey 1998; Jenkins 2006).</p>

In terms of Maternal and Child Health, the indicators are among the worst in the Pacific. The MMR, as outlined in the Table, is exceedingly high. Although a slow decline has been observed in the recent years, **under-five child mortality** and **infant mortality** also remain very high (64 per 1,000 live births<sup>23</sup> and 58 per 1,000 live births respectively). Proximate causes of child mortality in PNG are pneumonia, diarrheal diseases, malaria and other vaccine

preventable diseases, with diarrheal diseases in children under five years old on the rise over the past 5 years (Dept. of Health 2013). A recent study (Bauze et al 2012) found that district-level under-five mortality rates correlate strongly with poverty levels and access to services and there is a high degree of variation between districts.

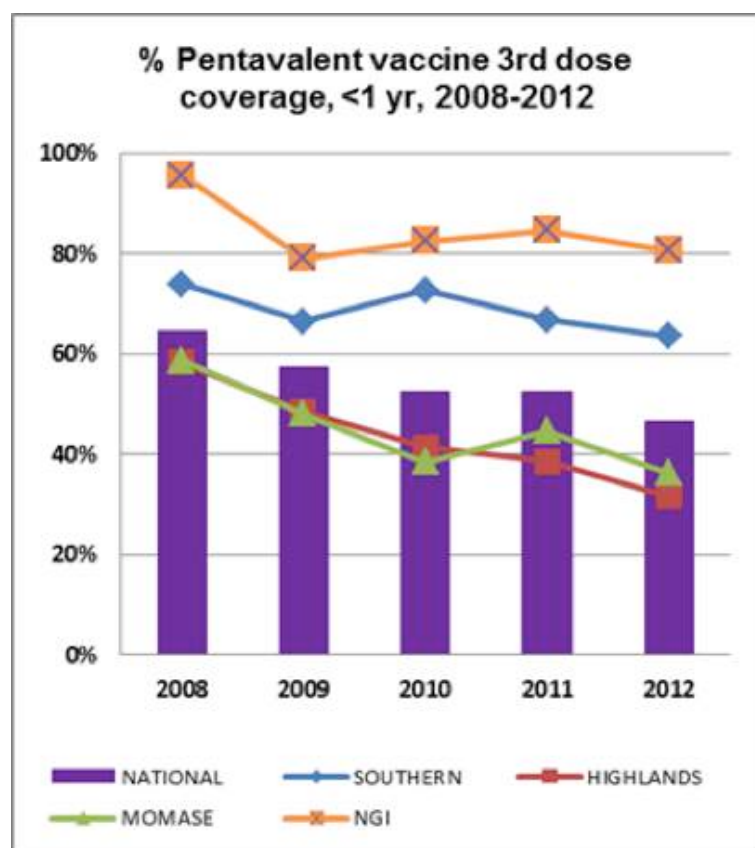
## BOX 5.1: CASE STUDY - THE REALITIES OF CHILDBIRTH IN RURAL PAPUA NEW GUINEA

Lyneth, a mother of four, was a 32-year-old who delivered a live male infant (her fifth child) in Lomitawa village on 3 February 2009. Lomitawa village is a two-hour flat walk followed by a three-hour strenuous climb from Sehulea Health Centre. Her four previous village deliveries were all normal. She was technically an unbooked mother, but she had attended two or three antenatal clinics when they were conducted near her village. She was given an expected date of delivery (EDD) and asked to come to the HC for delivery. Lyneth walked to the health centre two days before her EDD. On arrival she was told by a health worker that her dates were wrong and she wasn't ready to deliver, so she walked back to the village. Two days later, Lyneth went into labour at 4am. The baby was delivered normally at around 10am and was placed beside the mother with the cord still attached to the placenta. The placenta failed to be delivered and Lyneth started to bleed. The three sisters-in-law in attendance sat her up to allow the placenta to come out and rubbed her fundus, but they did not try controlled cord traction as this involves them viewing the exposed perineum and touching the mother's blood. For in-laws to actively pull on the cord requires a directive from the mother according to local custom, but Lyneth said nothing throughout the birthing process. She was given traditional herbs used to stop bleeding, but there was no change. After Lyneth had been bleeding for three hours, the birth attendants told the husband, Nepin, who was waiting outside, that Lyneth was still bleeding. Nepin realised that Lyneth had a problem. Nepin first went to Lyneth's relatives to explain what was happening and ask for help. They live about an hour's walk away from Lomitawa village. As they were busy working in the garden, they told him to make a stretcher and take Lyneth to the HC, but they couldn't help at that time. Nepin hurried back to Lomitawa village to make the stretcher, but was met on the way by a messenger saying that Lyneth had passed away. The baby's cord was cut after the mother died. About six hours had passed since delivery.

*Case study provided by Dr. Barry Kirby, Hands of Rescue Foundation, Milne Bay Province, PNG – reproduced with author's permission, September 2013*

<sup>23</sup> HDR Accessed on 14/08/2013 from: <http://hdr.undp.org>

Figure 5.2 % Pentavalent vaccine 3rd dose coverage, <1 yr, 2008-2012



Source: Department of Health 2013



A young child receives a measles shot at the 8 Mile settlement outside Port Moresby

**Immunization coverage** (measles in particular) has declined over the last 5 years from 57 per cent in 2008 to 46 per cent in 2012 followed by a slight increase to 52 per cent in 2013 (Department of Health 2013).. This level of coverage rates remains well below the levels required to prevent a resurgence of epidemic transmission of vaccine preventable diseases. Whilst Papua New Guinea has maintained its polio free status since 2000, there have been measles outbreaks in 2005 and again recently in 2013-2014. **Child malnutrition** remains significant. According to the findings of the 2009-2010 HIES, a high proportion of children in Papua New Guinea are malnourished, with pronounced rural-urban differences. Half

of the children under five years of age living in rural areas were stunted compared to one third of urban children. Underweight children are also more common in rural areas (28 per cent) than urban (20 per cent).

The **fertility rate** remains high, with important disparities between rural (4.5) and urban (3.6) and between highland (3.9) and islands region (4.6)(WHO 2011). Contraception use is low, with only 24 per cent of the population using modern methods of family planning. Unmet need for family planning is significant and the 2013 sector performance review noted a general decrease in the use of family planning across all regions (Department of Health 2013).

Table 5.3 Pooled prevalence of key STIs in selected populations in selected settings (community-based & clinic-based, based on a meta-analysis of published data between 1950 and 2010)

	Community-based settings		Clinic-based settings		Female Sex Workers
	Male	Female	Male	Female	Female
Chlamydia trachomatis	20.2	24.8	30	30	26
Gonorrhoea	10	16.3	NA	NA	33.7
Syphilis	12.9	7.9	5	7.9	31
Trichomonas vaginalis	12.3	40.8	16.4	23	39.3

**Regarding HIV**, the 2014 projections estimate that approximately 30,000 people were living with HIV in Papua New Guinea in 2013. According to the same source, HIV prevalence is estimated at 0.7 per cent of the total population in 2013. In 2013 Enga, Western Highlands, and Jiwaka provinces in the Highlands and the National Capital District all reported more than 1 per cent HIV prevalence amongst pregnant women attending an antenatal clinic (National Department of Health database).

The HIV epidemic in the country is predominantly driven by heterosexual transmission with a background of a high rate of untreated sexually transmitted infections (STIs) as noted above. The modes of HIV transmission consist of heterosexual intercourse (93 per cent), mother to child transmission (4 per cent), body piercing and homosexual contact (<2 per cent) (UNAIDS 2012).

The national prevalence estimate however, masks important disparities between regions and sub-population groups. Recent data seems to indicate a decrease in reported cases in urban settings and an increase in rural areas facilitated by communication and transport routes and development enclaves in the highlands. In addition, community based surveys have shown substantially higher HIV and STIs prevalence among sex workers (male, female and transgender) with a 17.8 per cent overall HIV prevalence in this population (Kelly, A et al 2011). This highlights the heightened social vulnerability of these highly stigmatized and marginalized sub-population groups and to some extent calls into question the 'generalized' nature of the epidemic in PNG (UNAIDS 2012). Gender disaggregated incidence data is consistent with a predominantly heterosexual transmission. However, more women (60 per cent) are diagnosed with HIV than men (40 per cent). This data reveals women's increased risk, in particular at a younger age (15-34 years), but it also indicates that pregnant women (attending Ante Natal Care) are a group that receive most testing.

Antiretroviral Treatment (ART) coverage has expanded in the past decade. At the end 2013, a cumulative total of 18,497 adults and children were in need of antiretroviral therapy (ART) with 74 per cent accessing treatment (2013 PNG HIV estimation report by the National Department of Health (NDoH) and National AIDS Council Secretariat (NACS)). However the consistent availability of antiretroviral drugs supplies throughout the country remains a major constraint. Modelling undertaken in 2006 predicted a significant impact of HIV/AIDS by 2025, with half a million Papua New Guineans infected, a national prevalence of 10 per cent, more than 12 per cent of the workforce lost, and a 1.3 per cent decrease in annual GDP growth (AusAID 2006). Although the recently revised prevalence data does not seem to corroborate these daunting predictions, the persistence of considerable and widespread underlying determinants of poor sexual and reproductive health leaves no room for complacency.

Although largely unrecognized in reported data (WHO 2011), the burden of **Non-communicable diseases (NCDs)** is increasing in Papua New Guinea. NCDs accounted for an estimated 44 per cent of all mortality in 2008 up from 37.9 per cent in 2004 (WHO 2011), with cardiovascular diseases (21 per cent), cancers (8 per cent), non-communicable variants of respiratory diseases (5 per

cent) and diabetes (2 per cent) contributing to total mortality respectively (2008).

Behavioural risk factors such as alcohol and tobacco consumption are all on the rise while fruit and vegetable consumption are in decline. Three of the most prevalent risk factors in the population aged 15-64 years are: being overweight accounts for 48.3 per cent (males 45.3 per cent females 51.2 per cent), daily tobacco smoking accounts for 43.7 per cent (males 59.9 per cent - females 26.6 per cent) and raised cholesterol, 36.8 per cent (WHO STEPS Survey 2010).

The latest WHO STEPS survey<sup>24</sup> (2007-2008) found very high rate of undiagnosed diabetes, which 'will cause a huge burden of morbidity and mortality' and only 0.4 per cent and 0.3 per cent of females and males respectively (aged 25-64) had none of the 5 combined risk factors<sup>25</sup> for NCDs. Reasons for this rise of NCDs in Papua New Guinea can be found in the rapid diet and lifestyle transition towards a western diet, brought about by trade liberalisation, economic growth and transition to the cash economy and urbanisation. These changes are more pronounced in and around urban centres and amongst the population groups that had early and longer exposure to these factors of change (Dowse et al 1994).

## HEALTH SYSTEM

The health system in Papua New Guinea faces a number of challenges, many linked to broader issues of capacity and governance, as discussed in Chapter 3.

Health services in Papua New Guinea are delivered through hospitals, urban clinics, health centres, community health posts and aid posts, predominately run by the government or faith-based organizations (Churches). Small-scale enterprise-based services and some private sector services are also present and traditional healers are found in most if not all communities.

There has been a gradual decline in the percentage of functioning health facilities in some parts of the country over the past 20 years: in 2013 only around 70 per cent of aid posts are operational nationally (Department of Health 2013). Some of the bottlenecks reflect the lack of constant availability of basic commodities, including essential drugs, as well as the adequacy and proper qualification of the health staff. The unsuitability of the health infrastructures contributes to the erosion of the public confidence in the health system, as indicated by a decline in outpatient visits per person (Department of Health 2013).

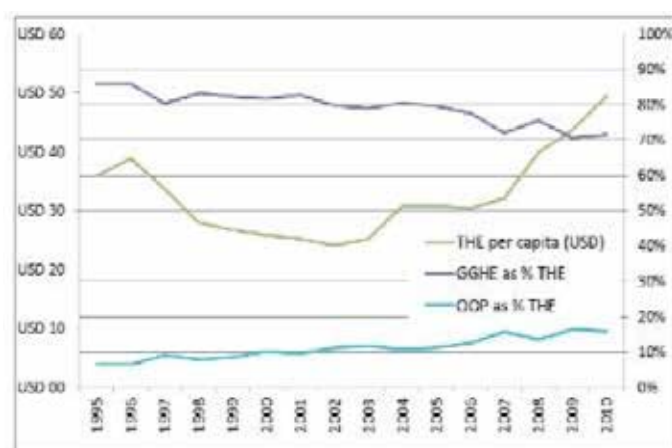
With regards to the **health workforce**, Papua New Guinea is facing a serious crisis in terms of human resources for health delivery, both in the numbers and skills mix. This shortage is a major obstacle to the provision of quality health care services. In 2009, an estimated 13,000 personnel worked across the country health system. Staff involved in direct service delivery make up 69 per cent of this total. There is one doctor per 17,512 people, five nurses per 10,000 population, and seven Community Health Workers (CHWs) per 10,000 population (World Bank 2010). The health workforce is aging quickly, while at the same time the capacity to train all cadres of health staff has also been significantly reduced over the past 15 years.

<sup>24</sup> STEPwise approach to Surveillance: simple, standardized method for collecting, analysing and disseminating data in WHO member countries.

<sup>25</sup> Current daily smoker; less than 5 servings of fruits and vegetables; low level of activity; overweight, raised blood pressure.

Other factors add to the burden of delivering quality health services across the population. These include, a relative absence of management capacity and technical skills in health-sector management, improving but still poor quality data collection systems, the fragmentation of organisational and administrative structures between the national, provincial, district and local government levels, poorly resourced laboratory diagnostic services, and vulnerability to sub-standard medical products due to relatively weak regulatory and law enforcement capacity.

Figure 5.3 Trends in Health Financing over the period 1995-2010



Source: WHO and National Department of Health 2012

The trend in Health Financing over the period 1995-2010 clearly indicates that while the General Government Health Expenditure (GGHE) as a percentage of Total Health Expenditure (THE) has been declining overall since 1995, the THE per capita has increased significantly from a low in 1995 to reach close to USD\$50 in 2010 (Figure 5.3).

Most recently the Government has substantially increased its share of health sector financing (Table 5.3 below). The Government provides 79 per cent of total health expenditure, and subsidizes the church health services to such an extent that they are considered part of the public system. General government health expenditure (including donor funds managed by government entities) accounted for 14% of total government expenditures in 2012 and 83 per cent of total health expenditure. Around 80 per cent of health spending is for workforce salaries.

Table 5.4 Health Financial expenditures, PNG

Selected Indicators	2010	2011	2012
Total Health Expenditure (THE) % Gross Domestic Product (GDP)	4.1	4.2	5.2
General Government Expenditure on Health (GGHE) as % of GDP	3.1	3.3	4.3
General Government Expenditure on Health (GGHE) as % of THE	75.2	77.7	83.1
Out of pocket expenditure as % of THE	13.8	12.5	9.5
GGHE as % of General Government Expenditure (GGE)	9.8	10.2	14.0

Source: <http://data.worldbank.org/country/papua-new-guinea>

Since 2012, the Government continued to increase the national budget share for health sectors, allocating 20 per cent for Health Services Improvement. In 2013 the Government also introduced the 'Free Basic Healthcare and Subsidized Specialty Care' Policy. Despite this commitment, the policy is yet to be implemented in most settings, due to administrative constraints, and fees are often charged in order to keep facilities functioning, given that funding does not reach the facility on time (Howes et al 2014).

Important additional resources for the health sector are received from international aid. The Official Development Assistance (ODA) for health from 2000 to 2010 increased by 90 per cent. In 2010, for MDG6 (Control of HIV/AIDS, TB, Malaria) the disbursement accounted for 40 per cent (up from 0 in 2000) (WHO 2012). Australia is PNG's largest bilateral and overall donor to the health sector, and provides sectoral worth around US\$100 million annually. Other major donors include ADB, New Zealand Aid, Global Alliance for Vaccines and Immunization (GAVI), and more recently the US Government/USAID. The Global Fund (GFATM) alone is another major source of financing for HIV/AIDS, TB and Malaria, with US\$83,264,062 allocated from 2015 to 2017 (Global Fund 2014). This funding comprises support for health commodities, medicines, human resources, and other inputs. However, despite these important resource allocations, the effectiveness of the health sector remains sub-optimal. The 2013 Health sector performance review (Department of Health 2013) noted that on average each year each province spends only about 25 per cent of what it is supposed to spend on health, in terms of the estimated minimum health expenditure.

#### HEALTH AND THE RESOURCES SECTOR

The health sector is affected by extractive industries both positively and negatively. Experience in Papua New Guinea is mixed. On the one hand, record government budgets – although based on a deficit at this stage – have been developed around the projected increases from extractive industries in the years to come. This has allowed (as noted above) for significantly increased allocations to the health sector at both national and sub-national levels, and the introduction of free primary health care across the country. Based on global experience, **the use of resource revenues to fund universal primary health care offers a significant mechanism to translate resource wealth into broad-based, sustainable improvements in human development.**

As noted above, however, to date these additional budget allocations have not translated into improved health services or outcomes in many parts of the country, in part due to the poor capacity of government to properly deliver health services to the more remote parts of the country. As global experience illustrates, additional funding – in particular at sub-national levels – can only be used effectively if individual and institutional capacities as well as the enabling legislative and policy environment are established and strengthened. In Papua New Guinea, budget allocations were increased without these improved capacities in place. This was a risk the Government took deliberately, to scale up service delivery at the local level. At this stage, the priority for the Government remains to improve the managerial capacity to properly plan, budget, use and monitor these allocations effectively.

Beyond the realm of government, there have been innovative practices for improved local health services through a range of private sector engagements in the health sector. A number of extractive operations have already been actively involved in health service delivery and improving health conditions, in the areas within which they operate, particularly around HIV, malaria and TB (Thomason and Hancock 2011). Ok Tedi Mining Limited (OTML), for example, have been the funders and drivers of the North Fly

Health Services Development Program (NFHSDP) since 2009, and have recorded increases in Maternal Child Health (MCH) indicators, such as the proportion of supervised births in hospitals or health centres from 51 per cent (2007) to 95 per cent (2012), and a significant drop in the number of malaria cases presenting at health facilities (from 437 per 1000 population in 2007 to 207 per 1000 in 2012), partly linked to the distribution of almost 50,000 bed nets in 2012, providing 100 per cent coverage (NFHSDP 2013).

Contemporary facilities operated by mining operations are described as generally better-equipped than government services. Staffing is better and the facilities more utilized. They provide some of the highest quality health services in the country (Thomason and Hancock 2011). In the case of the Lihir mine, for example, health initiatives undertaken by the company have been one of the most significant investments and achievements. Based around the company-funded, contract-operated Lihir Medical Centre (LMC), a series of programs have successfully reduced the rates of yaws, filariasis, and malaria across the island (Mitja et al 2013). Better access to health services has also reduced rates of maternal and infant mortality, and indeed an increase in life expectancy can be tracked since the start of the mine (Vail 2012). Overall, the conclusion of a longitudinal study spanning the pre-mine and mining periods found that 'the changed circumstances



*A health worker attending to sick children at the St. John's Hospital at Gerehu in Port Moresby*



of the Lihirian communities between 1991 and 2010 have resulted in an improved health status, particularly for the mothers and infants' (Bentley 2011:15).

In the petroleum sector, one of the most innovative developments has been the work of the Oil Search Health Foundation in 2011. This followed from the existing malaria control programmes that Oil Search had been operating, which successfully reduced the incidence of malaria in the project area (see Box 5.2 below). Oil Search contributed an initial US\$3.7million to the Foundation in 2011. The Foundation is now also managing significant health funding from international donors such as the Global Fund and Australian Aid, amounting to a total of US\$19million in 2012. Oil Search are also the managing partners and one of the key drivers for the recent PNG Industry Malaria Initiative (PIMI) that aims to work with industry to eliminate malaria in the country by 2050.

weaken local service delivery.

In terms of the local-level health effects, extractive operations impart accelerated social change on communities. Where not identified, mitigated and managed (by companies and government), these changes can lead to both short- and long-term adverse health consequences to local communities (Winkler et al 2010; World Bank 2009). At the Porgera mine, where social and environmental health changes have been extreme and largely negative, there has been a range of introduced diseases and conditions, including heightened rates of domestic violence, mercury poisoning (from alluvial gold mining and gold theft activities, Reto 2002), alcoholism and drug problems, and sexually transmitted infections (STIs) including HIV/AIDS (Bonnell 1999; Penny Johnson 2011). A range of non-communicable diseases caused by lifestyle changes such as unhealthy diets and the

## BOX 5.2: OIL SEARCH'S MALARIA CONTROL INITIATIVES

'Oil Search in Southern Highlands has achieved impressive results in malaria control, providing support and supervision for surrounding church, government and NGO health providers, making standard treatment courses and malaria diagnostics available through local community workers and storekeepers. Oil Search has also supported an HIV/AIDS control program for the area and helped strengthen local health physical infrastructure, both in collaboration with the ADB HIV in Enclaves Program and funding from the tax credit scheme. More recently Oil Search has established a foundation to extend its health contribution to PNG, which is partnering with AusAID and the Global Fund to extend health programs in PNG.'

*Thomason and Hancock 2011*

On the other hand, **the link between extractive industries and health is not problematic**. At the institutional level, the trend of greater corporate presence in the sector is not without issues and detractors and resources extraction projects have been criticized for working outside the realm and capacity support need of state institutions – which have the ultimate duty to provide services to the people. Such interventions, if not coordinated with government and other service providers, can undermine capacity and ultimately

consumption of alcohol and tobacco – including among wealthier landowners and mine employees, represent an additional burden to the health of the population and impacting on levels of human development. Loss of land to extractive industries often signals a shift from subsistence food production to a reliance on cash-purchased food and this can have implications (occasionally positive, but often negative) for individual and family health.

## BOX 5.3: THE RESOURCES SECTOR AND PAPUA NEW GUINEAN DIETS

'Since 1998 I have been working in a New Guinea oil field whose employees eat all three daily meals in a buffet-style cafeteria where one helps oneself to food, and where each dining table has a salt-shaker and a sugar-shaker. New Guineans who grew up in traditional village lifestyles with limited and unpredictable food availability react to these predictable daily food bonanzas by piling their plates as high as possible at every meal, and inverting the salt and sugar dispensers over their steaks and salads. Hence the oil company hired trained New Guinean health workers to educate staff on the importance of healthy eating. But even some of those workers soon developed Western health problems.'

*Diamond, 2012: 412.*

Global and Papua New Guinean evidence therefore suggests that the development of the resource sector poses both opportunities and challenges for improving the health of citizens. The wealth the extractive sector generates provides much needed means to improve infrastructure, staffing and quality of health care, through both increased health budgets at national and sub-national level, as well as through the provision of improved health infrastructure for local populations. This is done either through direct investment by the private sector, or through Public-Private Partnership. There remains however, a broad range of potential negative health effects on communities and employees at local operational levels, described above, that require careful attention and management. The challenge is to ensure that these new resource-based flows address and not deepen health inequities between regions, population groups, and genders, and integrate smoothly with government services and wider social change.

The evidence on health and wellbeing in areas where extractive industries are operating compared to areas where there are no similar activities remains an area for further research in Papua New Guinea.

## 5.4 EDUCATION

### EDUCATION STATUS

Like the health sector, **educational outcomes and status in Papua New Guinea are of concern**. The latest (2013) Pacific Regional MDG's Tracking Report provides a succinct overview of the challenges and notes in relation to MDG2 that:

Net enrolment rate up, but survival and literacy rates remain low. Against national targets – 85 per cent gross enrolment rate, 70 per cent cohort retention ratio and 70 per cent youth literacy ratio – Papua New Guinea slightly lagging against access and more significantly against retention and youth literacy. Government progressively abolished fees since 2010 to improve access. DOE cites 'in-school' (lack of educational infrastructure, absenteeism

and financial barriers), and 'out-of-school' (lack of parental support, low value of education due to limited jobs, as well as law and order problems) hurdles. HIV/AIDS epidemic also adversely impacting education outcomes.

At 3.9 years, the **average level of formal education** for adults in Papua New Guinea is low by Pacific and developing country standards. In part this is down to the relatively recent and limited spread of formal education. While the first Mission schools were established in the late 19th century, the spread of western style education to the Highlands and many remote parts of the country was far more recent. The formal education system comprises four tiers – elementary, primary, secondary and tertiary. Education in Papua New Guinea is provided by the Government, voluntary organizations (notably churches) and the private sector, with international schools in the main urban centres serving many expatriates and those of higher income. As a state party to the Convention on the Rights of the Child, the Government of Papua New Guinea has made a commitment to take steps towards providing free primary education to all children.

Despite the relatively high public expenditure on education, the **completion rate of primary school** is only 59 per cent. Access to education has improved in the past decade but there remains a need for improvement in quality, efficiency and equity (Howes et al 2014). Enrolment rates since the 1993 national reforms have tripled but educational resources and capacity have struggled to keep up. Gross primary school enrolment rates remain at 75 per cent (HIES 2009/2010), which is short of the MDG of Universal Basic Education (UBE) and the national adjusted target of 85 per cent gross enrolment. The gross secondary enrolment rate is below 45 per cent (see Table 5.4). The significant differences between net and gross rates at all levels indicate significant numbers of children and young adults participating in education at an older age than intended under the government system. Girls account for some 45 per cent of enrolments in the basic education cycle but

	National	Metro	Southern	Highlands	Momase	Islands
Gross elementary enrolment ratio						
Total	83.3	88.7	94.4	66.2	78.5	99.2
Male	83.4	85.6	97.5	73.2	79.8	84.9
Female	83.2	92.4	91.0	60.0	76.8	116.4
Gross primary enrolment ratio						
Total	74.4	84.8	75.0	76.1	62.4	78.6
Male	77.3	88.1	76.4	81.8	65.0	79.5
Female	71.1	80.6	73.3	69.8	59.4	77.7
Gross secondary enrolment ratio						
Total	44.4	63.7	39.2	42.2	25.9	49.5
Male	49.7	69.0	45.8	46.3	32.7	54.9
Female	38.9	58.6	32.4	37.3	18.4	44.2
Net elementary enrolment ratio						
Total	35.9	48.7	40.1	33.8	25.4	36.1
Male	35.5	47.6	39.6	35.1	26.0	33.1
Female	36.2	50.0	40.7	32.7	24.6	39.7
Net primary enrolment ratio						
Total	50.9	65.6	53.7	48.7	37.8	53.9
Male	51.4	68.2	53.0	50.1	37.7	52.9
Female	50.2	62.5	54.6	47.2	37.8	55.0
Net secondary enrolment ratio						
Total	28.1	41.7	25.4	28.4	12.6	31.4
Male	29.2	43.7	27.1	29.3	13.5	32.7
Female	26.9	39.8	23.7	27.3	11.7	30.1

Table 5.5 Gross and Net enrolment rates, by level, region and sex

Source: HIES 2009/2010

their proportion drops to 40 per cent by Grade 10 and 35 per cent by Grades 11 and 12.

There are some significant geographic differences in participation and enrolment rates: primary and secondary gross enrolment rates are significantly lower in the Momase region, and urban areas having the highest rates.

The 2009/2010 Household Income and Expenditure Survey provided figures on educational attainment (see Table 5.6 below). They show

*Table 5.6 Highest educational attainment*

Level	Percentage Achieved
Elementary	45.6
Primary	32.3
Secondary	14.8
Tertiary	7.3

Source: HIES 2009/2010

that while 15 per cent of the sample (of people aged 6 years or older) had completed high school, 46 per cent of the population had not completed primary school. Just over 7 per cent had completed a form of tertiary education. There are again significant differences by region, with over 50 per cent of Highlands and Momase populations not progressing beyond elementary school, fewer than 13 per cent of them completing secondary school and less than 5 per cent completing a tertiary education. For people living in urban areas 20 per cent had gone no further than elementary school, and the proportion who had attained secondary and tertiary educations were both around 26 per cent. There were also marked differences by gender, discussed further below.

A cruder measure of educational attainment, but one that is fundamental in terms of human development and engagement with the opportunities presented by the modern economy, is the literacy rate. The 2009/2010 HIES recorded that nationally 63.3 per cent of people can read and write, with the highest rate in urban areas (86 per cent) and lowest in the Highlands region (52 per cent). A higher proportion of males (69 per cent) can read and

write compared to females (57.3 per cent). At the provincial level, adult literacy rates (calculated indirectly from 2000 census figures, and hence probably overestimates) varied from over 85 per cent for Manus to 25 per cent for Southern Highlands and Enga.

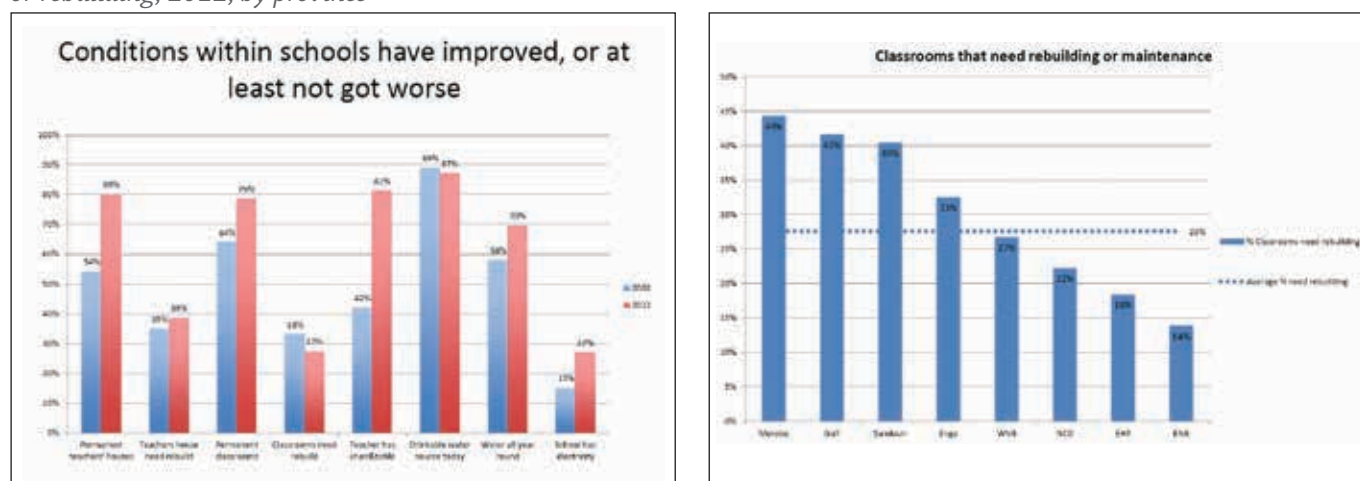
### EDUCATION SYSTEM

Like the health system, the education system in Papua New Guinea faces a number of challenges, many linked to broader issues of capacity and governance. Although overwhelmingly

funded by the government, provision of education in Papua New Guinea is supplied by a mix of government, church and private sector institutions. Like the health sector, education services have benefitted from the record budget of 2012 and 2013 through an increase of resources at national (38 per cent) and sub-national (87 per cent) level, with 20 per cent of the Services Improvement Programme (SIP) for provinces, districts and local level governments allocated for education services.<sup>26</sup> As a result of this budget injection, the Papua New Guinea Government launched the universal free primary education policy from 2010.

Despite these increased allocations by the Government, the most recent National Economic and Fiscal Commission report (April 2013) found that at the provincial level 16 of the then 18 provinces (excluding NCD and the Autonomous Region of Bougainville (ARB)), continue to fall below the minimum expenditure required to deliver a basic education service to their population. At the same time, student numbers continue to rise, driven by a growing population and the recent adoption of the universal free primary education policy (discussed further below).

*Figure 5.4 Conditions and facilities in 166 primary schools, (2002-2012), and % of classrooms that need maintenance or rebuilding, 2012, by province*



Source: Howes et al 2014

<sup>26</sup> Administrative Guidelines for PSIP, DSIP and LLGSIP, GoPNG, January 2013

Although much anecdotal evidence suggests a decline in the quality of education in Papua New Guinea over the past few decades, a recent survey by National Research Institute/Australia National University (ANU) that tracked changes in 166 primary schools over

rate of girls is typically higher than that of boys, reflective of the broader gender disparity in the country. The lack of qualified teachers and unfilled teacher positions is another matter of concern, as is the growing class size (see Figure 5.5), that will need



A teacher supervises a couple of grade six students during a Science lesson at Mingendi Primary School, Chimbu

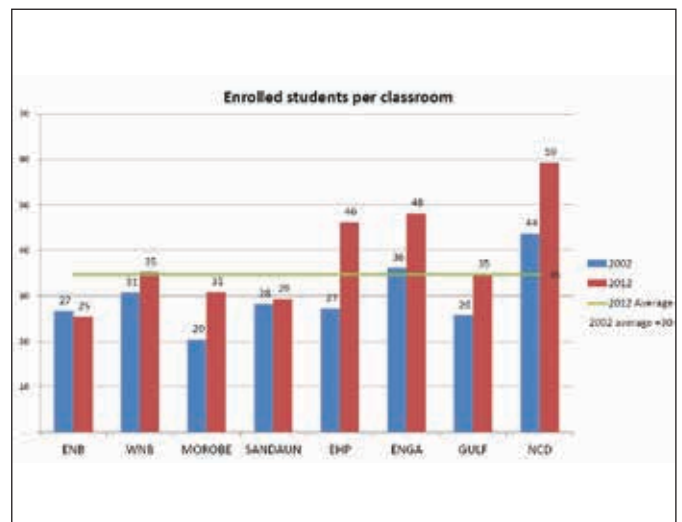
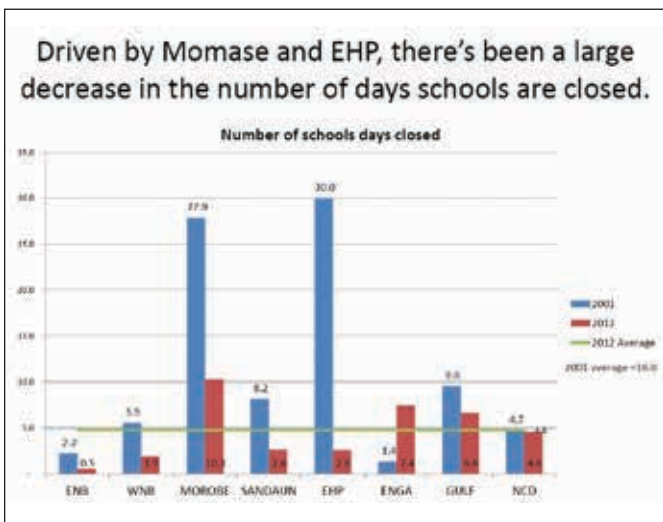
a ten year period (2002-2012) showed some slight improvements in facilities and resources for schools. Despite this, there are significant differences between provinces (see Figure 5.4 above), and many schools in Papua New Guinea continue to have limited or no classrooms, teachers, or basic facilities: 21 per cent for example, do not have permanent classrooms (Howes et al 2014). School closures and teacher absences can lead to children losing interest in attending school, although closures and absences have generally improved in the past decade (see Figure 5.5).

Children regularly dropped out of school in order to assist their families in the household and agricultural activities. The dropout

to be addressed to ensure that all children at least have access to a quality level of basic education.

The tertiary education sector has grown rapidly in terms of scale in the last decade in Papua New Guinea. There are currently seven designated universities, which 'made a significant contribution to the nation in its early years. They can do so again but, right now, the quantity and quality of graduates is far short of what is needed—due to inadequate resources and a range of governance and general service quality issues' (Garnaut and Namaliu 2010). Total in-country tertiary enrolments are around 5,000 students.

Figure 5.5 School closure (days, 2002-2012) and enrolled students per classroom (2002-2012) by Province



Source: Howes et al 2014

## EDUCATION AND THE RESOURCES SECTOR

The **link between natural resource-led growth and education is largely positive**, as revenue flows from the operations tend to support the expansion of educational opportunities for children and adults at local, provincial and national levels.

In the case of Papua New Guinea, the most obvious national expression of this positive link was the extension of the 'tuition fee free' policy at the national level in 2011 to cover all education to Grade 10, and significant subsidies for Grade 11-12, vocational, distance and university education. In 2014, it was reported that this policy was to cost K650million. The policy itself represents a very clear attempt to spread the educational dividend from the resources boom right across the country, and is in line with international best practice in the policy sense, and Papua New Guinea's international human rights obligations (under the Convention on the Rights of the Child (CRC)). The main concern expressed regarding this policy relates to its implementation, with the need to ensure that there are sufficient schools, with adequate teacher, equipment and material resources (as discussed above), able to cope with and deliver quality education to the increased numbers of students that the policy is designed to reach. Capacity development for more and higher quality education needs to go hand-in-hand with resource allocation, to ensure additional resources can be used effectively and for the equitable benefit of the population.<sup>28</sup>

At the Provincial level, New Ireland Province, home to the Lihir and Simberi gold mines, was commended by the NEFC (2013:49) as the only one of the resource rich provinces that had continued to provide significant additional resources to the education sector (over and above the cost of providing a basic education system). There are also provincial investments in education not directly captured by the NEFC process that show the potential to link resource revenues with improved education outcomes. One prominent example is the support given to education (from primary through to tertiary) by the Governor of Enga Province, Peter Ipatas. The Ipatas Foundation channels Provincial royalties from the Porgera gold mine into support for education facilities and students, by way of training opportunities, such as scholarships to attend 6 month skills training in tourism, hospitality, and heavy diesel fitting training in the Philippines (43 students graduated from the latter in June 2014).



*Porgera High School with mine and waste-dumps in background*

Locally, there are various mechanisms that have the potential to provide real educational benefits to children (and adults) living close to major resource projects. These include improvements in access to educational facilities as companies (and/or the national and provincial governments) commit to the construction of new facilities under the Memorandum of Agreement (MoA) or Benefit Sharing Agreement (BSA) for the development. At Porgera, for example, the agreements that flowed from the 1989 Development Forum provided for the construction of a new high school at Porgera, the development of an international school, and commitments to increased support for vocational training, distance tertiary education and more broadly, a range of elementary and primary schools in the immediate area of the mine, some of which were to replace pre-existing facilities. The construction of these facilities (Figure 5.6 above illustrates the Porgera High School with the mine site in the distance) rapidly expanded the opportunities for education for Porgerans and others from surrounding districts, although there are on-going issues with funding, management and administrative capacity, and securing teacher quality in remote environments.

Other initiatives include the establishment of Children's Trust funds at most of the project sites, with funds typically derived from a share of project royalties and usually split between direct support for landowner children educational costs and a longer-term element (as discussed in Box 4.6). Again this approach is in line with best practice in terms of translating resource wealth into improvements in human development. Details vary by project but the Porgera SML Landowners Children's Trust, one of the earliest established, has run for more than 20 years, despite occasional problems, and has allowed girls and boys from the mine lease areas access to international schools and scholarships for further national and international secondary and tertiary study.

A further contribution to local human development from these major resource projects are direct training and scholarships provided (often preferentially) to local landowner children and young adults, for a range of employment-related as well as broader forms of education. Ok Tedi, for example, has provided university scholarships to 871 students over the period from 1984. Employment related training in the sector has also provided opportunities for some Papua New Guineans to migrate and become employed in the global extractive industry in other parts of the world: Filer et al (2013) provide evidence that suggests there may be up to 600 Papua New Guineans employed in the resources sector in Australia alone, many in well-paying professional jobs. There are some direct vocational links between the extractive industries and the tertiary sector, including industry support for geology at the University of Papua New Guinea, and a Communication for Development course at UniTech Lae, whose graduates are increasingly taking up posts in Community Affairs Departments within the extractives sector. Vocational training by the companies themselves is also a contributor to human resource development: the PNG-LNG project during the construction phase provided over two million hours of certified training to employees.

Despite these largely positive effects on the education sector, **there are concerns that children in communities around large mining**

<sup>28</sup> Media reports also indicated that despite the free education policy, many schools charged "project fees" which caught many parents off-guard, and thus instead of enhancing access to education may have had some adverse effects with parents not expecting to pay project fees per child. Additionally, secondary schools and tertiary institutes also reportedly delayed enrolments by students when funds from the Government were delayed.

**or oil operations are often less likely to take up educational opportunities.** This occurs particularly in communities that are recipients of large and regular compensation or royalty flows, because increased revenue undermines the population's interest and incentive to access education for employment and improved livelihoods and there are reports of limited parental support for the education system in these same communities (Java 2011) for the same reason.

In sum, then, there are a range of linkages between the extractive industries and education in Papua New Guinea, at a variety of scales. While easily the largest and most critical link is through the national level budget allocations that have facilitated the Tuition Fee Free policy, there are also more select provincial and local-level initiatives that connect to particular provincial or local revenue streams or extractive operations. The reality is, though, that the direct contribution of the sector is dwarfed by the needs of the population, which overall continues to lag behind other Pacific Island countries in terms of educational engagement and outcomes. And in fact, while the sector's contribution to education is mostly positive, it is the Government as the duty-bearer that needs to ensure that the rights to education of its population is protected and promoted. An area for further research is whether education attainment levels are higher in areas where extractive industries are operating in comparison to other areas.

## 5.5 GENDER

While the Constitution of Papua New Guinea provides for equal opportunities and benefits for all citizens, and despite the country having signed up to several international agreements on women's empowerment and gender equality (including the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)), **levels of gender inequality in Papua New Guinea continue to be a pervasive problem**, as highlighted by the low Gender Inequality Index (GII) rank of 134 out of 148 countries. In fact, the 2010 MDG Progress Report for Papua New Guinea makes it clear that the targets set for the promotion of gender equality and women's empowerment are not likely to be reached by 2015.

Disparities are rooted in a complex combination of the country's traditional forms of gender relations and the relatively recent exposure of traditional and largely isolated and tribal society to rapid modernization. This inequality limits women's capabilities to achieve higher levels of human development. International experience also clearly shows that high levels of gender inequality provide a serious constraint on promoting sustainable and inclusive human development for society as a whole (World Bank 2012a).

*"I want gender equality. Women empowered to contribute to the development of this country"*

S.T, PORT MORESBY NATIONAL HIGH SCHOOL

The 2011-2012 Country Gender Assessment of Papua New Guinea (World Bank 2012b) provides three key pillars of gender disparity: (1) Access to resources through education, health and

entrepreneurship; (2) Access to rights through legal and social empowerment (including power to address gender-based family and sexual violence); and (3) Access to voice through participation in decision-making.

Amongst others, the assessment notes that:

- There is a persistent gap in the percentage of girls and boys of eligible age enrolled in secondary school, tertiary education and training institutions. At primary school level, the gender gap has narrowed in the last 15 years. This becomes expressed through the fact that only 57 per cent of women reported they could read and write, compared to 69 per cent of men (HIES 2009/10).
- There has been little improvement in key health indicators, especially for the majority rural population. With limited improvements in health service delivery, the impact of this is larger for women who face greater obstacles (security risks, for example) to accessing health care than men.
- Gender inequality at home (decision making and control over resources) hinders women's health seeking behaviour, which can cause delays in seeking medical help during birth delivery and affect decisions on the use of family planning methods.
- Violence (and the threat or fear of it) significantly reduces the range of actions a woman can take to support her family and enhance her health and education, as well as that of her children.
- There are inequalities in men's and women's economic opportunities in the agriculture sector (access to extension services and training, for example).
- Women traders are more disadvantaged than men by unsafe and insanitary markets, and poor transport infrastructure.
- There are continuing differences and inequality between women and men in formal labour force participation, occupations and wages.
- Women victims of crime continue to struggle with the police and prosecution authorities, as there is often insufficient policing and inadequate application of the law, and in many cases the predominately male law enforcement officers do not treat women victims of crime with adequate level of seriousness due to their own cultural perceptions. This results in low levels of prosecution of cases of family sexual violence, and gender-based violence (GBV).
- Village courts typically apply customary principles, which may discriminate against women, while the formal justice system is often difficult to access, particularly for rural people and especially rural women.
- Studies of gender-based violence (GBV) indicate that such violence appears to be widely accepted, with extremely high rates of GBV perpetuated by men in the Autonomous Region of Bougainville in Papua New Guinea, in addition to high rates of what the study referred to as 'economically and emotionally abusive acts' against women (Fulu 2013). There are also typically severely limited protection services available for GBV victims.

- Institutional responses for prevention of gender-based violence and support for victims are insufficient and inadequate. Access to voice and participation in decision-making is limited for women at all levels. Papua New Guinea has one of the lowest levels globally of women's parliamentary representation, representation and participation in local level and provincial government level is limited, and national initiatives designed to work towards women's equity, equality and advancement have generally been inadequately resourced or politically unsupported. For example, a 2012 legislative initiative to provide for one additional parliamentary seat per province to be allocated for women was unsuccessful.

## GENDER AND THE EXTRACTIVE INDUSTRIES

In terms of links with extractives, the World Bank notes that in general, 'women and the families they care for are more vulnerable to the risks created by EI' (World Bank 2009). The Country Gender Assessment likewise notes that 'women are more negatively affected by the social impacts of, and receive fewer benefits from, resource extraction industries.' A recent report on the social impacts of the Porgera mine (Penny Johnson 2012), for example, documented numerous detrimental effects of the mine development on women's lives and rights – some truly devastating (see Box 5.4 below).

### BOX 5.4: CASE STUDY - THE COMPLEXITY OF THE IMPACT OF MINING ON WOMEN AT PORGERA

'Life in the Porgera district has irrevocably changed since the mine began and these changes can outwardly be measured for the better. There are now roads, hospitals and schools. These potentially provide new opportunities for children to learn literacy and scholarship, to develop skills focussed on professional or vocational careers, to participate in the local capacity building employment and be involved in developing their community and improving access to goods and services. With the introduction of an equal opportunity strategy, the Porgera mine has developed positive incentives to help improve participation by local people including women. The mine did not renege on its responsibilities, creating an active and committed social development unit at PJV. This unit has also been instrumental in the creation of, and continued support for the Porgera District Women's Association (PDWA).

But there remains a pervasive problem: a generalised, and often institutionalised, sense of worthlessness and powerlessness for women in Porgera (a variant of a problem existing for women right across the Pacific area) and that could not be simply remedied within the complexities of the mine's normal working life, despite attempts. The life of a woman in Porgera is a particularly difficult one. In some cases it is no different to the lives of many women in villages across PNG, but in other situations it is harder because of constant pressures created by the negotiation and competition with an influx of outsiders, and the associated disruption to life.



*Porgera District Women's Association, 2010*

When you speak to men about women in Porgera, they mention gardens, children, pigs and sex. When you talk to women about men in Porgera they mention the negative impacts associated with the mine, the social disruption caused through the influx of outsiders, alcohol-fuelled violence, rampant polygamy or extramarital liaisons, and men's selfishness about sharing money or supporting their families. When women were asked about life in Porgera they talked about environmental degradation, their fears, their children, their hunger, their increased dependence on money and its subsequent hardship, the loss of land – and envy at the support women in the SML area receive. Alternately, if they were from the SML villages, the themes turn to envy of women with traditional life and gardens.'

*Source: Penny Johnson 2012: 3*

Further reports from Porgera also brought to light numerous gender-based human rights abuses, including rape and other forms of sexual abuse against local women perpetrated by mine security personnel in and around the mine operation (Human Rights Watch 2011). As a result of the high levels of sexual violence in Porgera, the company established a reparation program for victims of sexual violence by mine security personnel, on the condition that victims do not pursue legal action against the company. In many respects the local effects documented at Porgera reflect a particular, attenuated version of the broader national patterns documented above: disparities in access to education and health, high levels of GBV, and very limited representation.

At the same time, as the Country Gender Assessment also notes, 'some good models exist for giving women a share of the benefits from extractive industries, but these are not applied across all sites and industries'. At the national level, the World Bank-supported 'Women in Mining' initiative has built, in part, on existing local

institutions (such as the Porgera District Women's Association (PDWA)), and led to the development of a 2007-2012 Women in Mining Action Plan, that sought, among a range of health and education goals:

- 1) To increase the opportunities for women and girls to participate and benefit from the economic, political, cultural and social lives of their communities
- 2) To strengthen women's associations capacity to operate beyond mine closure
- 3) To ensure that communities are able to sustain their livelihoods
- 4) To mitigate and avoid environmental degradation that reduced the quality of life.
- 5) To promote and maintain safety, security and peace in their communities.'

The project is managed through the Papua New Guinea Chamber of Mining and Petroleum.

## BOX 5.5: WOMEN'S ROLES IN THE PEACE PROCESS IN BOUGAINVILLE, PAPUA NEW GUINEA

The widespread displacement stemming from the mining operations and violence from the enduring conflict in Bougainville had particularly severe impacts on women. In Bougainvillean society, kinship and land inheritance are passed on through female family members, and the loss of their land struck at the heart of their matrilineal identities and livelihoods.

Although they were largely sidelined from political engagement in the public sphere, including in the formal peace process, women spearheaded peace talks at both the local and national levels from the early stages of the crisis, providing support in the margins of official meetings and through discrete lobbying efforts. Their unique position in the family enabled them to facilitate dialogue between warring factions and in some cases, to engage directly in negotiations with local Bougainville Revolutionary Army (BRA) units. Women's groups also developed clandestine humanitarian networks that distributed food and emergency assistance in both government and BRA-controlled areas, despite severe restrictions on movement, and brought international attention to the crisis by engaging with influential figures in Australia and New Zealand, as well as in global fora.

During the signing of the Lincoln Agreement, which concretized further peace measures, some 50 Bougainvillean women attended the negotiations and drew up an adjoining statement, calling for greater inclusion in the peace process that read: 'We, the women, hold custodial rights of our land by clan inheritance. We insist that women leaders must be party to all stages of the political process in determining the future of Bougainville.'

Following the final peace agreement negotiations in 2001, a number of women's organizations held a summit aimed at consolidating and building upon existing women's networks and informing all women of the agreement outcomes to ensure meaningful participation in the reconstruction process. Today, although female representation in the political sphere remains low, women continue to seek space for their voices to raise concerns about the potential impacts on their land and communities in the resurgent discussions on resuming mining operations.

*Source: UNDP Pacific Center*



Employment opportunities, with their ability to transform livelihoods, are created for women both directly (on Lihir, for example, there were 175 Lihirian women employed by the mine, 24 per cent of the Lihirian mine workforce), and indirectly, such as the several hundred women employed by National Catering Services (NCS), a company within the Anitua group (see Box 5.5 above). Such employment is not uncontested by men, the bulk of the jobs are low-skilled menial jobs, and women often do not retain sole control over their incomes. Regardless, female employment is also linked to improvements in self-esteem and the ability of women to exert greater control over their own (and their children's) lives.

There are also a range of **innovative corporate and community partnerships** that exist to provide support for women within the extractive sector at the operational level. Two such examples are the institutionalization of a dedicated revenue share in the Ok Tedi Community Mine Continuation Agreements (CMCAs) discussed in the previous chapter (Box 4.6), and the ExxonMobil livelihood restoration initiatives (see Box 4.5). Ok Tedi also has a zero tolerance domestic violence policy for its staff at Tabubil, that incorporates control over alcohol in the township, and the immediate termination of staff upon domestic violence complaints.

As with the initiatives in the health and education sectors, these corporate contributions to gender equality and women's empowerment are laudable and do make a difference to lives and levels of human development for some women and groups around the extractive operations, in the face of often dramatic and potentially devastating effects of the enhanced revenue flows on domestic and sexual violence, levels of polygamy (Bonnell 1999) and prostitution at extractive industry sites. At the country-level however the overall impact of the EI on gender equality and women's empowerment is minimal and addressing this requires significant government commitment and resources, and close collaboration with civil society.

## 5.6 EXCLUSION AND INEQUALITY

National level development indicators conceal some **marked differences in development achievement**. There are four critical dimensions of inequality and exclusion: **(i) a rural/urban divide; (ii) provincial and district level variations; (iii) differences by gender; and (iv) differences derived from wealth**.

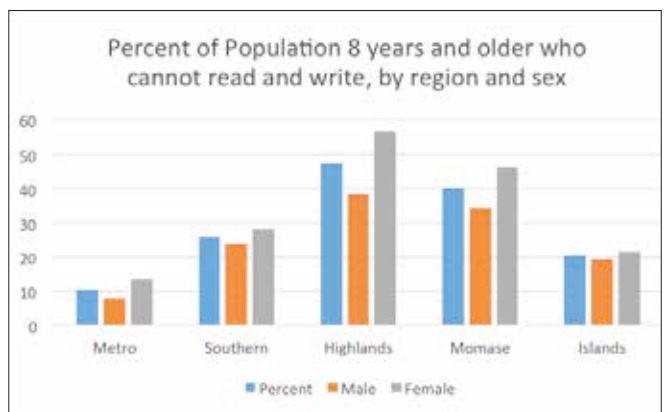
First, the approximately 20 per cent of Papua New Guineans living in the urban areas have, overall, significantly higher levels of human development than the 80 per cent of the population who reside in rural areas. While an urban/rural divide in human development is common in many parts of the world, in Papua New Guinea it is particularly stark. To give three examples, a simple

poverty headcount calculation shows that the poverty rate in urban areas is under 30 per cent, while in rural areas it is over 40 per cent, despite significantly higher costs of living in urban areas. Likewise around 50 per cent of the rural population had no primary education, while for the urban population the figure is less than half of this (24%). 58 per cent of urban households have a TV, against only 8 per cent of rural households (HIES 2009/2010).

Second, the rural/urban divide also conceals significant differences across different urban and rural areas. For instance, the incidence of hardship is significantly higher in the highlands and remote and isolated islands, even compared to other rural areas. The highest rates of deprivation by almost every measure occur in rural parts of the Highlands and Momase regions (see Figure 5.7, for example). Within each of the regions, there are again significant variations by province, and then again by district within most provinces (see Figure 5.8 for one health example). Because of this it is important to speak of 'poor places' or 'hotspots' of deprivation at quite local scales (Allen et al 2005), and where relevant these are highlighted below.

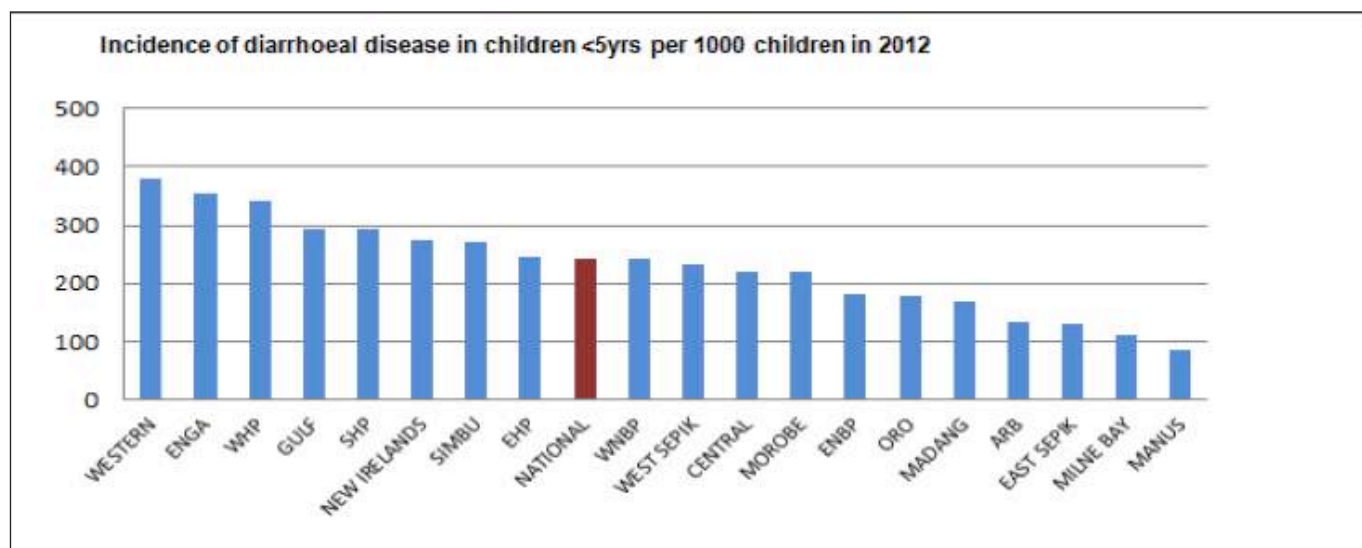
The National Population Policy (draft 2013) contains an analysis of a set of 'indices related to' various MDGs at the provincial level (Appendix 3). In the absence of data that will allow for the calculation of a province level HDI, this shows that after the National Capital District (NCD), the five provinces that make up the Island region of Papua New Guinea (the provinces of Manus, New Ireland, East and West New Britain, and Bougainville) have higher levels of achievement of the MDGs (and hence higher human development) than the rest of the country (along with Milne Bay). After this, the geographic spread of achievement is mixed, with the four provinces with the lowest overall rankings being Enga, Gulf, Southern Highlands and West Sepik.

Figure 5.7 Percentage of population aged 8 years and over who cannot read or write, by region and sex



Source: HIES 2009/2010

Figure 5.8 Incidence of diarrhoeal disease in children under 5 years per 1000 children, by Province, 2012



Source: Department of Health Sector Performance Annual Review, 2013, Indicator 6

Third, as the Gender Inequality Index (GII) and Gender section immediately above indicate, measures of Human Development vary greatly by gender in Papua New Guinea. On virtually every measure of social and economic wellbeing and empowerment (from income to school enrolment, life expectancy and parliamentary representation) males score more highly. Even more worryingly, Gender-Based Violence (GBV) and female-specific health measures (including the Maternal Mortality Rate) are shockingly high (more than twice as high as elsewhere in the Pacific). In Papua New Guinea 'gender inequality remains a severe impediment to development and one of the most visible violations of human rights' [cited in World Bank 2012b:5].

Finally, economic inequality continues to stratify the measures of Human Development among Papua New Guineans. The Gini coefficient (a measure of economic inequality) at 0.51 (1996 figure)<sup>29</sup> remains high by developing country standards, and this translates into fewer opportunities for social and economic advancement for the large proportion of poor people in Papua New Guinea, urban and rural. Hence 'the proportion of 15-29 year olds completing grade 6 in the poorest 40% of the population [effectively those living in poverty] is half that of the top 20%' (UNICEF 2012:xi). This in turn creates a social-economic cycle of insecurity and deprivation: educated people are far less likely to end up in poverty than those without an education – around 55 per cent of those with no education live below the upper poverty line compared with around 30 per cent for those who have completed high school, and less than 15 per cent of those who have a university qualification.

Deprivation, poverty, insecurity, gender-discrimination and lack of opportunity in Papua New Guinea are connected and multi-faceted. Over the past 40 years Papua New Guinea's natural resource-based development wealth has failed to generate forms of growth that redress these constraints, and deliver broad-based improvements in human development to a significant proportion of the population. The growth that has occurred is meaningless

for most people in terms of improving their levels of human development and wellbeing.

#### EXCLUSION, INEQUALITY AND THE RESOURCE SECTOR

Extractive sector operations by their very nature produce economic inequalities between regions and places. They occupy relatively small areas and tend to operate as economic enclaves: the further away from the operation, the more limited the effects. This reality is a large part of the reason why the state has vested mineral ownership in itself, as it can – through taxes – spread the economic benefits in a more even fashion through delivery of public services. Despite this approach, inequalities are still generated at provincial and local levels, some of which were touched on in the previous sections.

At the provincial level, those provinces which host a large-scale extractive operation receive additional direct funding from royalties, an equity share in the operations (usually reserved from the State equity holding), and a Special Support Grant (SSG) directed at the provincial government out of national government revenues). Hence, as noted earlier, the six richest provinces in terms of combined central government grants and internal revenue include all four of the existing provinces that host an established major extractive operation: Enga (Porgera), Western (Ok Tedi, and consistently one of the top two provinces by revenue), New Ireland (Lihir) and Southern Highlands (Kutubu, Moran and Gobe oil). These provinces, through the royalties, dividends and other flows are then in a better position than others to meet the costs associated with delivering basic public services (NEFC 2013).

At local levels, the extractive operations necessarily increase inequalities within the surrounding communities. One of the few detailed studies of this examined processes at the Porgera gold mine in the 1990s (Banks 2005). It found that:

'inequality at Porgera can be conceived of in terms of four overlapping and intersecting axes: geography, hierarchy, gender, and residential status.'

<sup>29</sup> Anecdotally the last decade has produced a rise in inequality, but there is no more recent calculation.

In terms of geographic inequalities, the drawing of lease boundaries necessarily sets up distinctions between project 'landowners' and others. These boundaries – which typically cross pre-existing tribal, clan or other social group boundaries – then produce economic distinctions between those entitled to the lucrative royalty and other direct benefit streams, and those who are not.

A consistent finding around these resource operations is that traditional forms of 'bigman' leadership provide access for individuals to a higher proportion of these revenue streams: in one extreme case two individuals secured 75 per cent of the value of the largest compensation payment (K520,000) for a clan land payment at Porgera in 1992. Some of these landowner leaders and representatives become very wealthy, in an environment where there is little transparency.

Gender is a major axis of inequality in Papua New Guinea society and, as noted at several points elsewhere in this chapter, at the local level the evidence from Porgera and elsewhere is that this inequality is reinforced by the economic and social processes connected to extractive operations.

Finally, as also noted above, the evidence suggests that migrants tend to be better off than residents in these extractive operation communities. They tended to earn more and were more likely to own a business, although without the connections to land, they possessed fewer gardens and less security in terms of their residency in the area. The apparent economic success of many

of the immigrants does often make them a target for disgruntled landowners.

## 5.7 LAND, CULTURE AND CONFLICT

Land is of central importance to people in cultural and economic terms in Papua New Guinea, especially in rural areas. Land rights and resource ownership are thus fundamental issues underpinning natural use and resource management, and are central to resource-based forms of development. Approximately 97 per cent of Papua New Guinea's total land area is held under customary forms of land tenure by the traditional landowners – communities and clans – a right guaranteed by the National Constitution. This produced a largely classless and casteless egalitarian society (with a few exceptions of societies that have a chieftainship system), such that the entire population has (in theory at least), access to land and other resources for subsistence needs, shelter and other necessities of life. Land also binds people through shared kinship and localized forms of identity politics – as a rule, and despite decades of migration and urbanization, most Papua New Guineans still identify with their place (and people) ahead of their province or nation. Land in this sense acts as a form of 'social capital', strongly bonding people to each other, and to shared customs and traditions (see Box 5.6). The diversity of belief systems and forms of local social organization, as well as agricultural systems and local environments, produces often complex sets of connections to land, livelihood strategies and political interests and alliances in the contemporary setting.

### BOX 5.6: THE 'WANTOK' SYSTEM AS PNG'S SAFETY NET.

The 'wantok' (tok pisin = 'one talk') system is a social system where people who are related to each other by a common language, ethnicity, district or by provincial boundaries (defined here as 'wantoks') will jointly participate in socio-political, economic, traditional and cultural activities in Papua New Guinea society. It is a system where people depend on, care for, and help each other in many aspects of society. While traditionally family and clan members were obligated to provide support for each other, the 'wantok system' today performs a set of broader roles. It acts, for example, as form of social security, whereby families look after their sick or elderly family members. In Papua New Guinea, relatives of deceased people typically take care of orphans, and if there are no direct relatives surviving, clan members adopt the children who are left behind. In terms of economic activity, people invest in their wantoks, which sets up an obligation on these wantoks to repay when they are in need. When, for example, a man marries a woman and pays a bride-price to his wife's parents, his wantoks contribute to this. Typically a groom will announce to his wantoks that he is putting together a bride-price payment at an appointed time and his wantoks will contribute. Later, when his wantoks who contributed want to pay their sons' wives' bride-price, for example, he is obligated to repay them with what they invested in him. The wantok system has a set of underlying values for its practices. Three such values are protection (physical and social), accountability (to kin) and that allegiance to wantoks outweighs other considerations. When the wantok system operates well in the village and traditional society, it helps maintain a community's wellbeing, and provides a form of social glue or strength for the community. In the modern context, the wantok system is now under pressure, especially in the urban areas. Not only are these social connections stressed by the concentration and complexity of urban lives, but the expectations and pressures from wantoks can also lead to the abuse of office by employees, managers, public servants and politicians. Often, migrants respond by striving to focus on their individual family rather than the clan, allowing them to accumulate wealth away from the bounds of social obligations. Regardless, the 'wantok system' is often held to blame (by Papua New Guineans and outsiders) for a variety of problems within contemporary life in Papua New Guinea – most prominently corruption and nepotism but also, as wantoks start placing untenable pressures on better-off relatives, the breaking down of traditional kinship relations.

The specific forms of land tenure vary considerably across the country, and range from strongly patrilineal (where right to land flows from one father) to matrilineal (rights inherited from the mother's family) and various forms of systems where rights can be inherited along either paternal or maternal lines. Land tenure systems are typically flexible, allowing for combinations of ownership, user rights and allocation rights determined through social relationships by peaceful or violent means. Resource developments can, though, see the tightening and narrowing of access to rights to land, and group belonging. The impact of mining on land is also in part related to deep local cultural heritage connections to the landscape, which can create other complexities and contests in the context of mining developments (see Bainton et al 2011). One consequence of the strength of land rights is that most forms of economic activity by non-owners can only be sustained through partnership with the traditional landowner(s). As a result, **land ownership is simultaneously a control mechanism as well as a potential constraint for development.** Disputes over land are common and compensation claims can hinder investment that requires the use of land (such as the various types of resource extraction).

One central and contested local understanding of land is fundamental to the whole extractives sector: this is the widely-held understanding that minerals and petroleum – indeed anything – that lies under the land should be regarded as owned by the owner of the land's surface. Derived from various traditional customs (with a strong dose of common sense), people's views on this matter fundamentally clash with the modern State's legislated ownership of sub-surface minerals (see Ongwamuhana and Regan 1991; Nonggorr 1993; Donigi 1994). In the 1990s, the handing back to landowners of a significant share of the State's royalties derived from mining and oil can be regarded as a de-facto form

of recognition of local or shared 'ownership' of the resource. This contest – between state and local actors over control and rights – has come back into public arena by the proposed new mining laws on Bougainville (which propose landowner ownership of subsurface minerals) and even a proposed new Mining Act in Papua New Guinea by the former Prime Minister, Sir Julius Chan. These approaches seeking to encode more Melanesian understandings of ownership – tied back to the fundamental reality of land – are likely to cause significant industry concern around access and the negotiation of development agreements.

Moving partly in the other direction, though, National Development Plans (including the Vision 2050 and the DSP 2010-2030 discussed above) envisage that an increasing proportion of customary owned land will be placed under other forms of tenure and more formal administration (although the mechanisms for doing this are still embryonic and likely to be highly contested). At the same time customary land tenure provides the overarching control and protection that ensures resource extraction cannot take place without consultation with, and involvement of, the landowners.

In many parts of the country inter-clan or tribal conflicts remain an everyday reality, and – despite the growing influence of the contemporary systems of policing, law and justice – in many cases have become more intense (thanks to the use of modern weaponry) and linked into politics and disputes around natural resources, particularly with the lucrative extractive industries. This means that many extractive industry conflicts in Papua New Guinea involve sets of competing local interests, as well as those of the State and the relevant extractive corporation. The closure of the Panguna mine on Bougainville was associated with the most destructive of these conflicts (see Box 5.7), but analysis of conflict at other sites can reveal the complexity of conflict generated by

## BOX 5.7: THE ORIGINS OF THE BOUGAINVILLE CONFLICT

At Panguna, local resistance to the development from affected local communities was present from the start, but economic and political imperatives overwhelmed concerns for local involvement and participation. There was limited community say in the planning for the development of the mine, as there was no legal requirement at the time for the company or the administration. Local landowners were eligible for limited compensation, and although provincial MPs argued successfully for a return of some of the royalties to the province, the direct returns were very limited (5 per cent of the 1.25 per cent royalty on production, for e.g.). Resentment and tension built through time, especially as a younger, disenfranchised generation started to assume power in the community. The Panguna operation became something of an exemplar for the worst local effects of large-scale mining. There was widespread physical and social dislocation, massive environmental effects, internal conflicts within the community, conflicts between locals and other Papua New Guineans ('redskins'), and limited state or corporate community affairs capacity to resolve these growing conflicts. It was these social and environmental effects that provided much of the rationale for the forced closure of the mine in 1989 by local landowners, building on island-wide secessionist sentiment, and leading to the subsequent escalation of state violence and the eventual devastating civil war on Bougainville.

Sources: Filer 1990; Regan 1998; UNDP 2007

The impact of PNG-LNG throughout Hela and Central Provinces has been dramatic, in economic and social terms, particularly for those communities that live adjacent to project sites and infrastructure. Communities have experienced a massive influx of outside contractors and economic migrants (with annual population increases of more than 11 per cent in communities adjacent to some of the highland production sites (PNGIMR 2014), loss of land for production facilities and infrastructure, access to new revenue streams and economic opportunities, and heightened political and representational conflict. There is also evidence that this has had detrimental effects on domestic violence and community conflict generally, and claims of human rights abuses within these communities (Oxfam 2012). The application by ExxonMobil of international standards (particularly the 2006 International Finance Corporation (IFC) Performance standards) in terms of Occupational Health and Safety (OH&S) resettlement,

community development, and grievance mechanisms, signals a new level of engagement in the local complexities of these developments for the industry.

Three of the largest multinational operators in the extractives sector (Barrick, Newcrest and ExxonMobil) are signatories to the Voluntary Principles on Security and Human Rights, a set of international principles and tools (such as security risk assessments) 'designed to guide companies in maintaining the safety and security of their operations within an operating framework that encourages respect for human rights'. Such principles can be useful in ensuring, if nothing else, that security and human rights issues are aired in a transparent manner. It is clear however, that the principles themselves are not enough to reduce the often very Melanesian forms of disputes and conflicts that arise in the Papua New Guinea extractives sector (see Box 5.8 below).

## BOX 5.8: EXCLUSION AND CONFLICT AT THE PORGERA GOLD MINE

The issue of inclusive development is complex at Porgera, and exclusion, (associated with inequalities within community and particularly between recent migrants and landowners), is an important contributor to conflicts at Porgera. In addition to debates regarding the mine's national contribution, its local effects and comparisons with its environmental impacts to Ok Tedi and Bougainville, Porgera is notable for three contentious issues that continue to provoke debate around the contribution to human development of both the mine and the sector generally: the Fly-In, Fly-Out (FIFO) workforce, resettlement and 'illegal miners'.

A significant original point of contention at Porgera was the FIFO nature of the non-local workforce. Landowners in particular had pushed for the bulk of the workforce to live, with their families, at Porgera, but for a variety of reasons (including upfront costs and concerns around security) the agreements provided for both the staged development of a new township at Paiam, and the staged reduction of the FIFO component of the workforce, subject to satisfying the security concerns. The FIFO debate, which has also arisen at Misima and Lihir as well as Porgera and is a key point of discussion in the current review of the Mining Act, is based on differing viewpoints on the costs and benefits of housing all mine employees in townships close to the mine (Tabubil at Ok Tedi is the one significant purpose built town housing a mine's workforce in Papua New Guinea). While there is likely to be some local economic leakage from a FIFO workforce (although the evidence is less clear than some of the assertions made), others argue that there are likely to be a range of social problems created in mining townships, especially where such towns are easily accessed by surrounding populations (such as at Porgera), there are questions about the sustainability of purpose built towns post-mining, and significant additional upfront costs associated with construction of a permanent township which can potentially affect the viability of projects.

One of the other key issues at Porgera is the issue of resettlement of landowners. Under the original Relocation Agreement, landowners whose houses and lands were required for the mine development were compensated and provided with a relocation house that was constructed for them on land that the landowners identified. The importance of land, and the desire to stay close to their lands, meant that the early relocations occurred mainly within the Special Mining Lease area, but over time population growth and high-levels of migration from kin and other related people has meant these relocation settlements have become severely overcrowded and lacking in facilities for the population. Constant calls for complete relocation from the leases – which may have some advantages for the company in terms of long-term mine planning – have been complicated by the need to establish eligibility criteria for this assistance, and the need to identify other land to relocate people to, given most now have little land over which they can still exercise primary rights. This situation at Porgera has led a push from the regulator (the Department of Mineral Policy and Geohazard Management and the Mineral Resources Authority) to develop a more comprehensive resettlement policy in line with international standards (such as the IFC Performance standards on involuntary resettlement).

The standard of environmental health and general living conditions within the mining lease has also been complicated by the fact that unlike the other major mines, Porgera's ore contains visible gold, potentially accessible by hand techniques. This has created a situation where at times hundreds of 'illegal miners' (or 'local geologists' as they are known locally) enter the open pit mine at Porgera to collect ore that they then process by hand back in their houses. This places them in conflict with mine security and at times local police as well, with a number of deaths recorded. Many of these 'miners' are young migrant men, drawn by the lure of potential wealth, and their presence in the settlements around the mine area has sparked occasional police and security force action, including burning down houses of suspected 'illegal miners' in 2014. In recent years reports of human rights abuses by mine security forces and police have been documented and investigated by international NGOs (Human Rights Watch 2011), police and the mining company itself, with charges laid against a number of staff. This is the most recent form of more generalized law and order issues that the mine has faced over its operating life. These issues occur partly as a result of the pre-existing social environment but largely due to the social transformations the mine has brought to the community – particularly the effects of the massive revenue flows into segments of the population, the huge extent of in-migration and the breakdown of traditional forms of social control. In addition, the sometimes over-zealous reactions of the police and mine security that have produced violations of human rights among the surrounding communities.

Sources: Johnson 2012; Gilberthorpe and Banks 2012; HRW 2011; Golub 2014.

A significant effort is expended by the extractive sector companies to secure a local 'social license to operate', based on the assessment that such **community-focused 'Corporate Social Responsibility' (CSR)** activities help mitigate the risk of community disruption to the mine. Each of the operations approaches these activities in different ways. In terms of its community development and social responsibility activities, Hidden Valley is notable for the number of private-public partnerships it has entered into with church, government departments and research institutes to deliver its development programmes that focus on health, education, agriculture and infrastructure. Ramu Nickel, like the other resource projects, is involved in a variety of local-level community development efforts that contribute to community health, education, food security and livelihoods in particular. Yet the effectiveness of these programmes is hard to determine given the limited social monitoring undertaken (Banks et al 2013).

More recently there have been initiatives and approaches adopted by mining corporations, sometimes encouraged and supported

by the state (especially MRA) to adopt more inclusive ways of negotiating access for developments and for handling grievances with a view to defusing conflict before it occurs. Under current regulations, disputes with companies are channelled through the MRA's project coordinators and mining wardens, and can then enter the formal legal system, resulting in often lengthy, expensive and uncertain outcomes. Internal disputes within communities – many of which are at least tangentially related to the resource development in terms of conflicts over the distribution or use of monetary benefits – tend to be handled initially using traditional forms of conflict resolution (compensation and exchange ceremonies). If they escalate to armed conflicts, however, or the assets of a nearby resource operation are threatened, a state presence such as the police will usually result. Often though, the traditional mechanisms can be used to diffuse long-standing tensions and conflicts, and promote more inclusive forms of resource developments, which in turn can provide for greater security for the developer (see Box 5.9).

## BOX 5.9: CASE STUDY - BUILDING PEACE AND DEFUSING CONFLICT USING TRADITIONAL MECHANISMS

Tradition can provide the basis for conflict resolution strategies in the contemporary era, even around large-scale capitalist extractive operatives.

On Lihir, the traditional 'trespass' marker – twisted ginger root plant leaves known as a gorgor - is utilized by landowners and respected by the mining company. When a local person is aggrieved about a particular issue in connection with land they have rights to, they are able to use a gorgor to indicate to the company that there is a need to sit down and talk through the issue. The company respects the markers and does not enter the area behind where the gorgor is placed (at times gorgors have been placed inside parts of the plant site). While this strategy has been successful in ensuring that conflict has been relatively low-key on Lihir, the practice has started to be abused by non-residents and other landowners and, as a result, the number of gorgor incidents or threats to use it, has increased markedly (Bainton 2011).

This appears to be a reflection of frustrations around the delivery of benefits, or access to benefits, or attempts to seek further concessions from the operator. In response, the MRA recently issued a public notice on Lihir that stated that use of the gorgor outside the frame of its proper, agreed (by landowners and Lihir Gold) application and traditional use was in contravention of the Mining Act, and could be subject to fines or imprisonment.

On Bougainville, since the conflict ended, women have taken a central role in rebuilding trust and social capital across the communities on the island. Drawing on matrilineal land rights – inherited through the mother’s line – women have played a critical role in facilitating the on-going rebuilding and reconstruction of the island’s economy and society. These sorts of roles for women – building on the traditional position within the society – are also recognized much more explicitly in the discussions around the possible reopening of the mine.

*Sources: Bainton 2011 (Lihir); Lees et al 2013; Noble 2013 (Bougainville).*

## 5.8 SUMMARY

In total, the **effects of the extractive industries on the social ‘pillar’ are complex, with clear potentially positive individualized benefits** in terms of access to better health and education for affected communities and significant budgetary contributions at the national level to these same arenas. **Balancing this, though, is (1) the relative failure of successive governments to effectively deliver quality health and education services equitably** across the affected societies and to leverage resulting national wealth to improve access to basic services for the entire country, and **(2) the pervasive, highly damaging and often irreversible social effects on communities** from in-migration, conflict and the ‘social pathologies’ often associated with mining and resource booms – alcohol, gambling, gender-based violence, prostitution, and the generalized ‘social disintegration’ of traditional, egalitarian communities.

Within the sector, there is a case for more inclusive forms of growth that can provide for social stability and sustainability at national and local levels (the social case for inclusive forms of growth) as well as development that respects the culture and needs of local populations through inclusive processes that provide transparency and informed consent. As part of this, and also to secure a ‘social license’, there is a need for on-going efforts to improve the ways in which the extractive industries address the local social impacts of their operations so as to positively contribute to more sustainable forms of human development. Governments, at the same time, need to cultivate public-private partnerships to anchor EI initiatives in state institutions and processes, and thereby support sustainable development beyond the life and geographic scope of extractive industry operations. Ultimately, it is the Government as the duty-bearer in the country that needs to ensure that the right to development of its population is protected and promoted.

# CHAPTER 6

## Environmental Aspects of Extractive-led Growth in Papua New Guinea

### 6.1 INTRODUCTION

This chapter addresses the question: *what have been the effects of Papua New Guinea's extractive industries on the natural environment, and how can these effects be better managed so as to promote more sustainable forms of development.*

The **environmental aspects of extractive-led growth have in many ways the most damaging impact on sustainable human development.** Large-scale mining (but also Artisanal and Small-Scale Mining (ASM) and to a lesser extent the oil and gas sectors) extracts minerals from the earth, and in the process moves hundreds of thousands of tonnes of material, creating a variety of waste streams. The huge infrastructure and production facilities associated with these operations also consume land, forest and watersheds, permanently altering landscapes and habitats, and potentially detracting from the human development opportunities of people who reside in and beyond the areas of operation sites.

The form of environmental impact from the extractive sector is both point-specific – that is largely focused on a particular island or valley – as well as linear, along road and power corridors and waste polluting river systems. In this sense, the effects tend to focus on smaller areas than, for example, the more widespread environmental damage caused by forest exploitation or commercial agriculture. The impact is also characterized by being largely irreversible (or at least requiring many decades for habitats to return to their former state), especially around the production facilities for the large-scale mines, and involving production processes that require (or generate) materials that can be toxic if released into the environment (oil, cyanide, or unrecovered copper, for example).

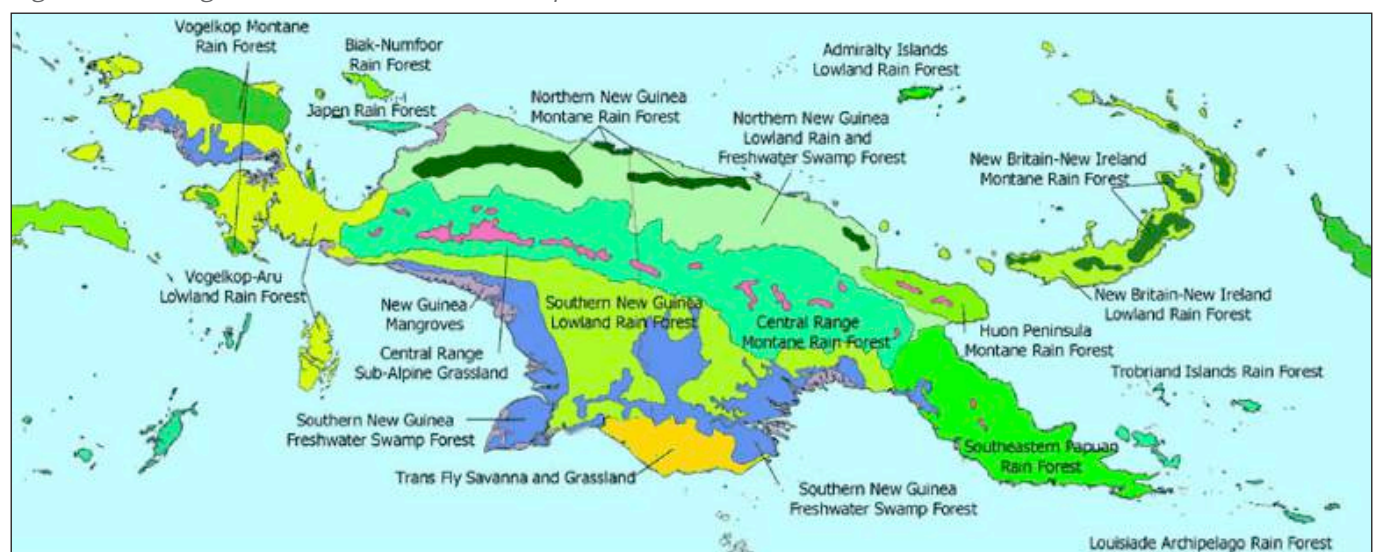
This chapter opens with a brief introduction to the unique and globally significant environment and ecological assets of Papua New Guinea. It moves on to cover the environmental governance regime, and then describes the consequences for the PNG environment of the extractives-led growth path the country is on.

### 6.2 ENVIRONMENT AND DEVELOPMENT IN PAPUA NEW GUINEA

**Papua New Guinea's natural environment provides levels and diversity of natural wealth that only few countries in the world possess.** Papua New Guinea has been labelled one of the seventeen 'mega bio-diversity' countries (Mittermeier et al 1997). It is estimated that due to the complex geological history, relative isolation from continental areas with similar climates, its topographic diversity and the evolutionary diversification of species, **Papua New Guinea hosts approximately eight per cent of the world's total biodiversity** in just one per cent of the globe's land area (Allison 2007). The country is home to over 700 species of birds including the world's smallest and some of the world's largest parrots, the largest pigeons, all of the world's three species of cassowaries, and 38 of the 42 known birds of paradise. The country is also home to the world's largest butterfly, and almost two hundred species of mammals, including two of the world's three monotremes and all of the world's tree kangaroos. In addition, there are almost certainly many species of flora or fauna still unknown to science and hence the number stated could double or triple if more research is undertaken.

Papua New Guinea hosts a variety of landscapes<sup>30</sup> and a bewildering array of diverse natural ecosystems (Sekhran and Miller 1995), rich in flora and fauna (marine, terrestrial, freshwater and coastal). The Papua New Guinea Country Study on Biological Diversity (Sekhran and Miller 1995) estimates there are around 400,000 species of fungi, plants and animals, with up to 90 per cent endemism in some groups. However, obtaining definitive information on the biological richness of the country is difficult because even today many areas are poorly studied. The World Wide Fund for Nature (WWF) Eco-region series classifies Papua New Guinea into eight eco-regions, each of which contains distinct assemblages of flora, fauna and ecosystems (see Figure 6.1).

Figure 6.1 Eco-region series classifications for Papua New Guinea



Source: World Wide Fund for Nature WWF

<sup>30</sup> The World Wide Fund for Nature Ecoregion series classifies PNG as containing eight ecoregions of which the Bismarck Solomon Sea and Southern New Guinea Lowland Forests are two examples where each contains distinct assemblages of flora, fauna and ecosystems.



New Guinea (Papua New Guinea and West Papua combined) has the **third largest extent of remaining tropical rainforest in the world** (and around 60 per cent of the country's land is covered by forests). These forests contain important resources for food, fibre, building materials, and support a variety of wildlife, as well as providing broader ecosystem services such as carbon sequestration, watershed protection, water supply, soil stability and fertility. The lowland rainforests are highly diverse with other common vegetation types including savannahs, swamps, semi-deciduous forests, low to high mountain forests, grasslands and small areas of high alpine vegetation. There are over 9,000 species of higher plants, including as many as 1,500 species of forest trees. In addition, Papua New Guinea has the highest global mangrove diversity and hosts over 70 per cent of the region's mangrove area (372,770ha). Traditionally plant species have been used for subsistence and traditional activities and continue to provide much of the population with their basic needs for building materials, food, medicines and cultural activities.

Papua New Guinea is also a **global epicentre of marine biodiversity** and has one of the world's longest coastlines that stretches over 17,100km. The Exclusive Economic Zones (EEZ) of 3.1 million square kilometres, is host to a variety of coral reefs (over 40,000km<sup>2</sup> in total), with extensive sea grass beds, mudflats, estuaries, mangroves and other coastal ecosystems. Economically this area supports abundant tuna resources and diverse marine fisheries (see Appendix 1). Around 1.5million people live in rural coastal villages and their existing levels of human development depend very much on marine resources for subsistence, income and many cultural practices.

Given that 85 per cent of the population reside in rural areas, the natural environment is critical in terms of livelihoods and levels of human development. The diversity across the country in terms of the resources available in the natural environment means that each community receives a different endowment of natural resources from their local environments.

### 6.3 ENVIRONMENTAL GOVERNANCE

Despite the importance given to natural environment in the constitution and policy documents such as Vision 2050, the institutions of governance for the environment are relatively weak. As noted in Chapter 3, the Environment Act (2000) is the key piece of legislation, seeking to give force to the constitutional and policy emphasis on the conservation of the diverse landscape, ecosystems, flora and fauna. It is this Act, along with allied pieces of legislation, such as the Conservation Areas Act (1992) and the National Parks Act (1982), that seeks to ensure the environmental aspects of sustainable development are taken into account in the developmental progress of the nation, and is the legislation that will be looked towards when seeking to ensure the intent of sustainable policy is enacted. The Environment Act was described as 'comprehensive and complete' in a 2005 review (ADB 2005), which did note that it was mainly directed at regulating large-scale projects, and had less applicability or relevance for small- or medium-sized projects.

The Act sets out the process for the preparation of Environmental Impact Assessments for major projects (labelled Level 3 projects), one that requires notification, inception reports, assessments and

public consultation periods as part of this process, which is given more specific shape by the 2004 Department of Environment and Conservation's (DEC) 'Guideline for Conduct of Environmental Impact Assessment and Preparation of Environmental Impact Statement'. Separate guidelines have also been developed for Social Impact Assessments. Penalties can be imposed on developers who undertake activities without authorization, or in breach of existing conditions of their approvals.

The Department of Environment and Conservation (DEC) – reporting to the Minister for Environment – is the main government agency charged with giving effect to the Environment Act. Another potentially significant institution is the Office of Climate Change and Development (OCCD), although its focus is primarily on externally sourced, globally funded programmes relating to climate change, such as the investment by the UN in Reducing Emissions from Deforestation and Forest Degradation (UN-REDD+) (OCCD 2011; Babon and Gowae 2013).

DEC has been historically under-resourced, with an operating budget of just K200,000 in 2005 (ADB 2005). Although the budget allocation has increased significantly, the bulk is external donor project funding, and the Department continues to have limited technical capacity to assess environmental impact assessments that it may receive, and limited resource or capacity to monitor or ensure compliance with environmental conditions attached to approvals or permits. There have been a number of external donor funded capacity-building projects that have sought to support aspects of DEC's activities, but there is continuing internal and external concern at the weakness of the institution. Some government Ministers are frustrated at the lack of national/local capacity built by international partners over the years. They want to see more of the international resources being made available to government so that it can decide what to support and where and when. But issues of 'fiduciary risk' often prevent international funding being made available directly to government. In a move that signals a disconnect between the regulatory regimes around the productive and environmental impacts of the sector, the MRA recently commissioned Environmental Impact Assessments (EIAs) for projects at advanced stages of exploration, in part due to DEC's insufficient capacity to provide leadership in the area. Currently DEC is undergoing a transition to a Statutory Authority (Conservation and Environmental Protection Authority, or CEPA).

In 2010, amendments were made to the Environment Act allowing the Director of DEC to grant retrospective authorization and approval for activities that may have been in breach of the Act, or conditions of existing approvals. This was widely regarded as being targeted at closing down legal action by landowners concerned about the environmental effects of the Ramu Nickel mine's DSTP system, and more broadly restricting public protests against the permitting of development projects. In 2012 the new government revoked these amendments. This episode highlighted both the scope for political influence in the environmental governance regime, and the tendency to compromise environmental values for the economic benefits associated with the extractive industries.

In this context, **much of the environmental governance within the extractives sector resides with the corporations themselves.** Each of the recent operations has produced large, comprehensive

EIAs, in line with international best practice and guides such as the IFC Performance Standards.

The Social Impact Assessments (SIAs) produced as part of these same processes are typically of a very high quality by international standards, although not as well-resourced nor as substantial as the EIAs. The SIAs and subsequent social monitoring programmes are typically the poor cousins of the EIA process, and are rarely able to deal with social and political complexity associated with the mines (Banks 1999b, Burton 1999). Environmental reporting to DEC is done regularly by all the operations, and as with the EIAs, this process generates a significant amount of data. In terms of transparency of this environmental information, though, DEC rarely publicizes the information received, and what the corporations do report (in Annual reports, or Sustainability reports) is typically a small proportion of this material. The publicly listed companies typically report basic information, such as the number and magnitude of spills or breaches of environmental permit conditions. This does not include the activities of other corporate actors, such as MCC at Ramu Nickel. Environmental governance in Papua New Guinea is, then, variable, and the proposed transition to the Conservation and Environment Protection Authority (CEPA) presents opportunities to strengthen this element of governance, although the transition to a statutory authority by itself does not guarantee this.

#### 6.4 THE ENVIRONMENTAL CONSEQUENCES OF EXTRACTIVE-LED GROWTH IN PAPUA NEW GUINEA

Resource-based extractive industries have the **potential to create significant environmental disturbance and destruction**, across a broad range of habitats and resources that communities draw on – forests, agricultural land and water. Indeed several of Papua New Guinea's large-scale mining operations are often held up globally as examples of industry 'worst' practice.

Large-scale mining operations, despite attempts to improve practices, typically cause the greatest damage. This is primarily because of the scale of the operations, which move hundreds of thousands of tonnes of material on a daily basis, most of which ends up in waste dumps or is discharged into the environment.

The Ok Tedi mine in Western Province uses a riverine tailings disposal system, depositing approximately 80,000t per day of tailings as well as several times more waste rock directly to the Ok Tedi/Fly River system. This has had a dramatic effect on almost 2,000km<sup>2</sup> of rainforest downstream and affected the livelihoods of over 30,000. The environmental effects – as for other instances

*The environmental aspects of extractive-led growth have in many ways the most damaging impact on sustainable human development.*

of riverine tailings disposal such as Porgera and Bougainville – are threefold: the vast increases in sediment load for the river systems leads to the reduction or loss of the downstream aquatic

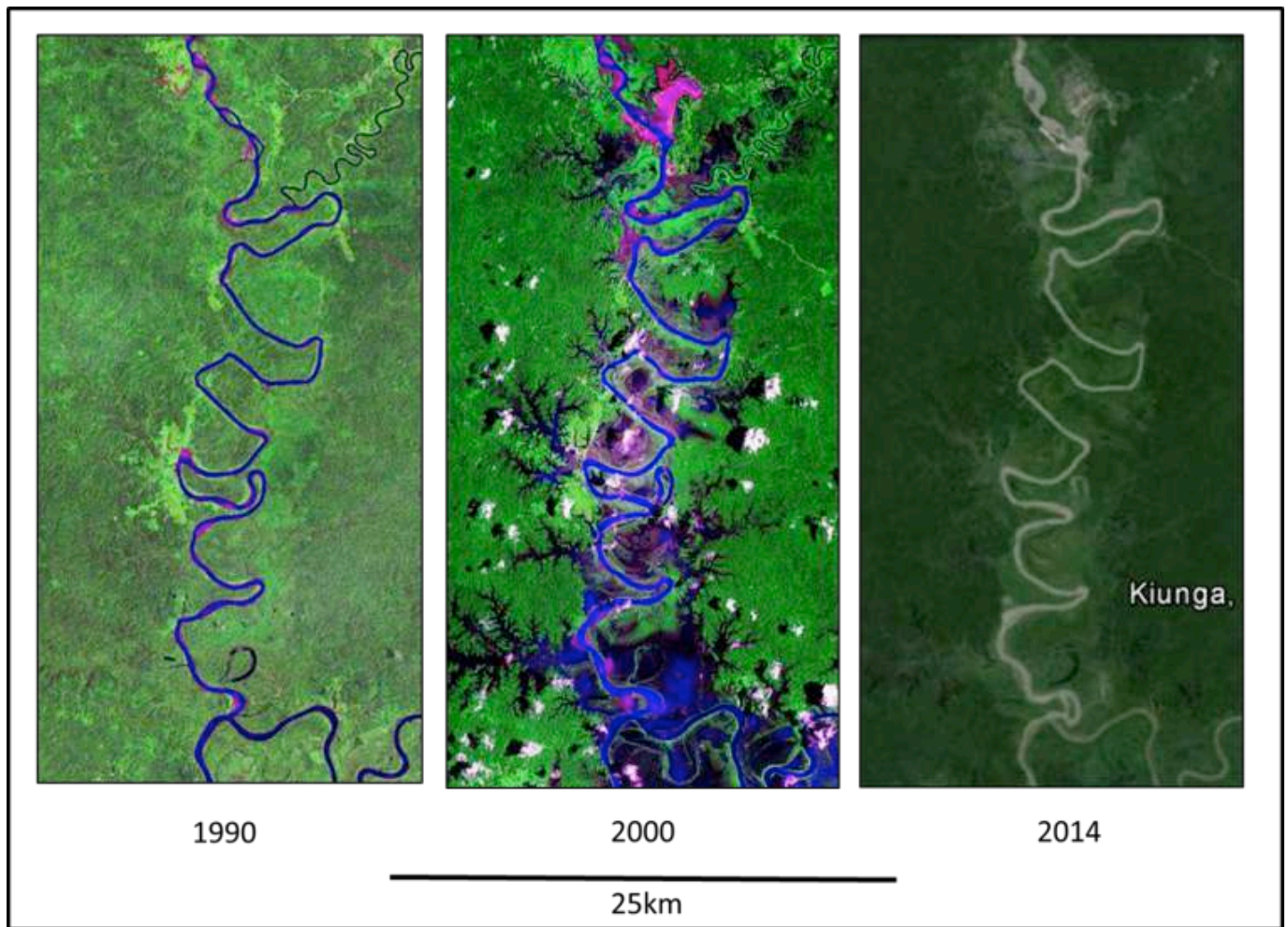
ecosystems; flood events push the sediment over the riverbanks and across the surrounding vegetation, smothering and effectively killing it; and finally, chemicals and particularly heavy metals within the tailings (copper in the case of both Panguna and Ok Tedi) can lead to elevated levels of these metals downstream (Swales et al 1998). It is also significant that these impacts are likely to persist for many decades as the sediment is slowly moved through these systems and the impacted ecosystems take time to regenerate. The Jaba river on Bougainville, for example, is still highly impacted by sediment and elevated levels of metals from the BCL Panguna operation more than 25 years after the closure of the mine.

At Ok Tedi, the environmental effects, a subsequent lawsuit, and the associated corporate exposure, are factors that eventually drove BHP to relinquish its majority shareholding in the Ok Tedi operation (Banks and Ballard 1997, Kirsch 1997, 2013). BHP's 52 per cent shareholding (increased to 63 per cent with the withdrawal of Inmet from the project in 2008) was placed in a Singaporean-based Trust company – the Papua New Guinea Sustainable Development Programme company (PNGSDP) – which was mandated to apply the dividends from the shareholding to sustainable development initiatives in Western Province, and across the rest of Papua New Guinea. Significantly the agreement between the State and BHP over these arrangements included a clause that protected BHP from any future legal action relating to the environmental effects of the mine, effects that are expected to persist for decades. This legal indemnity was overturned with the action of the State to take over control of PNGSDP in 2013.

One of the critical factors in the Ok Tedi environmental conflict was the exclusion of downstream communities from the initial negotiations and decision-making regarding the mine development in the 1970s and early 1980s. The original design for the mine incorporated a tailings dam to retain the fine processed tailings from the mine, however a major landslide in 1984 destroyed the footings for this dam, and the Government acceded (originally temporarily but eventually, in 1989, permanently) to the mine, proceeding with riverine tailings disposal (Jackson 1982; Pintz 1984). Along with the waste rock deposited in the headwaters of the Ok Tedi river system these tailings have caused widespread environmental damage to the Ok Tedi and Fly River systems, along with massive negative effects on livelihoods and human development (see Box 6.1 below).

The satellite images below show the Ok Tedi River running down the centre of the image, from (approximately) Bige down to the junction with the Fly River. The dark shadows in the 2000 image – particularly in the lower reaches of the Ok Tedi and around the junction with the Fly – are where sediment overtopped the riverbank and spread along the adjoining land and forest. Forest in these areas is effectively suffocated by the sediment and suffers dieback. The most recent image – using true colour as opposed to enhanced false colour imagery – appears to show some regeneration which could be the result of the dredging operation at Bige (top centre of the 2000 and 2014 images), extracting mine-derived sediment from the river. This could also be a seasonal effect (with less water apparent in the 2014 image) rather than regeneration.

Figure 6.2 The lower Ok Tedi river, 1990, 2000 and 2014



Source: Landsat imagery (1990, 2000) and Google Earth

International and national NGOs devoted considerable attention to Ok Tedi from the early 1990s, and between 1994 and 1996 a lawsuit filed by 30,000 downstream landowners against BHP in Melbourne created intense media scrutiny and public pressure in Australia. This eventually led to a settlement (Banks and Ballard 1997) that included the establishment of compensation mechanisms for those affected, and commitments to reduce the impact of the mine’s waste on the river system. While the attempts to reduce the impact of the mine’s waste on the river system (through the establishment of a dredge to remove sediment at Bige) have had an effect in dampening the sediment load on the river system, it is still anticipated that the area affected by the tailings will continue to grow to around 2,000km<sup>2</sup> over the remaining period of the

mine life. The effects of overbank topping and elevated levels of copper have extended hundreds of kilometres downstream along the Middle Fly, and are predicted to persist for many decades. The compensation agreed by BHP has become encoded in a series of continuing payments to communities along the Ok Tedi and Fly River systems, known as Community Mine Continuation Agreements (CMCAs). These agreements essentially provide for annual payments to communities (the structure of which includes directed shares for women and community projects) in exchange for their consent to the mine operation continuing. This epitomizes the notion of ‘trade-off’ for the affected communities – developmental ‘benefits’ in exchange for environmental damage – although in this instance they really had few options.

## BOX 6.1: CASE STUDY - THE EFFECTS OF THE OK TEDI MINE ON THE PEOPLE OF THE LOWER OK TEDI RIVER

In 1997, Alex Maun, one of the lead plaintiffs in the legal action taken against BHP as operator of the mine, gave a paper at a workshop in Canberra in which he outlined the impact of the environmental damage for the people of the lower Ok Tedi.

“The Ok Tedi River has been polluted with the sediment from the mine. The river bed has filled up with sediment causing the river level to rise. The sediment has also been deposited along the river banks, leaving a mud effluent of a metre deep.

The Ok Tedi River overflows its banks, depositing waste and sediment along what was the most fertile area for gardening. Instead of enriching the soil so that crops can be grown almost continuously along the edge of the river, the sediment from the mine prevents crops from growing at all. The sediment also contains copper particulates which are deposited on the banks, and can cause a serious risk to our lives. When there are heavy rains upstream the small creeks and streams which feed into the Ok Tedi River back-up causing sediment to wash into these areas. This causes serious damage to the ecosystem, including the creeks and streams. The mouths of the creeks are being blocked by sediment, causing floods further up the creeks and streams, drowning the forests. Now we river people can no longer drink from the river, nor can we swim, or bath or wash clothes or fish in the river. We are unable to replace the protein in our diet that was formerly provided by aquatic resources. Gardens are no longer made near the river banks, where it used to be fertile. The light cannot penetrate through the river. The river now flows very fast and turbulently as the original river courses are now shallow. Sediments flowing from the mine cause the river banks to be eroded away. What was fertile customary land eroded away and was replaced with sediment. The lives of all the people along the Ok Tedi River are completely disastrous.'

The extractive industries (and particularly current mining operations) can also impact directly on the marine environment. Most obviously the Deep Sea Tailings Disposal (DSTD) practiced at Lihir, Simberi, Ramu Nickel and previously Misima has impacts on the deep-sea environments in the immediate vicinity of these operations (Brewer et al 2007). While there is still a large element of uncertainty attached to the long-term impacts of this method of tailings disposal, recent research has shown it to be relatively

benign in the right receiving environment (Scottish Association of Marine Science (SAMS) 2010), (see Box 6.2).

Other effects on the marine environment from the extractive industries include waste rock disposal in the near-shore environment (as in the case of Lihir), runoff into the oceans, and waste from the shipping associated with construction and operation of these mines close to the ocean. While potentially

## BOX 6.2: FINDINGS OF REVIEW OF DSTP IN PNG

The Scottish Association of Marine Science (SAMS) independent investigation and review of DSTP in Papua New Guinea (an EU funded project under the Mining Sector Support Programme (MSSP)) carried out an intensive assessment of the effects of the DSTP systems at Lihir and Ramu, as well as carrying out biological survey work at Misima. The report argued that:

'DSTP has major impacts on deep-sea sediments and their biological communities, and that the effects persist for at least three years after tailings discharge has ended. Where it is incorrectly designed or badly managed DSTP can also cause serious damage to coastal resources and, potentially, communities. In PNG the deep sea bed has very weak interactions with the surface and coastal zones and so might be thought to be a safer long term repository than a terrestrial impoundment – especially given the high rainfall and frequency of earthquakes in PNG. There are several examples of disastrous failures of tailings impoundments. Tailings impoundments may need to be maintained for decades or even centuries after the mine has closed and the company dissolved.'

SAMS argued that ultimately, the decision to allow DSTP must be a political decision and the logical outcome of that may be that some areas cannot be mined even though they may have valuable resources. Alternatively, society may value the provision of income that can improve public services and amenities more highly than the deep ocean floor. These are not scientific questions and in different countries there may be different answers - not least because they are geographically different. What science can provide are measures to reduce environmental risk once a decision to utilise DSTP is taken. If these measures are accepted then it is then a political decision to ensure that monitoring, policing and adaptive management is sufficient to reduce environmental and societal risks to the absolute minimum.

*Source: Scottish Association of Marine Science 2010*

significant for neighbouring communities, these effects tend to be limited in their geographic scope.

Oil operations have been far less destructive than large-scale mineral extraction as the environmental footprint of production sites is limited in scale, and the narrow corridors associated with pipelines tend to be well managed. The major environmental threat from this industry – a large-scale spill – has not happened yet in Papua New Guinea, and the industry would argue this is testament to the high safety standards they employ.

Much debate currently exists around the potential developmental and environmental effects of the **seabed mining** plans being advanced by Nautilus Minerals off the coast of New Ireland Province. These seabed resources are likely to become an increasingly sought after resource in the future. However, given the lack of international experience in this area, environmental consequences are unclear. The developer (and the State, which has permitted them), regards the effects as 'moderate and reversible'. Critics are much less convinced. Some marine biologists worry the mining will start before researchers can assess how it will affect deep-sea ecosystems (Gramling 2014). Others argue that national and international regulators aren't ready to ensure that underwater miners protect the environment. Papua New Guinea will in many respects become the global testing ground. Given the operation will be the first of its kind globally, there will be close attention given to monitoring and assessing the degree of environmental disturbance it creates (Gramling 2014).

## 6.5 EXAMPLES OF BETTER PRACTICES AND BENEFITS

Examples of more environmentally sustainable practices and benefits are beginning to appear in the extractives sector – although there are limits to how far the effects of these massive operations can be minimized. **Certainly environmental management systems and practices have improved over the past three decades**, however the large-scale mining operations typically move hundreds of thousands of tonnes of material daily,

and can generate – in the case of Ok Tedi – 80,000t of tailings per day. The key issue in terms of the focus of this report is to develop environmental practices associated with these operations that minimize the negative effects on long-term sustainable human development.

Recent innovations within the sector include the use of **biodiversity offsets** for the PNG-LNG project (see Box 6.3 below), and alternative tailings management systems. On the latter, the Hidden Valley mine has a tailings dam integrated into the project to contain the up-to 10,000t a day of tailings the plant can generate, and to date this aspect of the operation has been successful. Although the management of construction waste was far less so (see Mudd 2012). At Porgera, where riverine disposal has been used for tailings (along with erodible waste dumps that add additional sediment load to the river system), there have been investigations into whether co-disposal of tailings within stable waste dumps can be achieved. What is apparent is that while tailings disposal does require adaptation to specific local contexts (for example, the lack of land on Lihir was a key part of the decision to proceed with DSTP), there is constantly scope to re-evaluate current operational practices in the search of less environmentally damaging practices.

**Mine closure and mine-site rehabilitation** is another area where advances in other parts of the world are continuing to find application in Papua New Guinea. Mine closure planning in Papua New Guinea (overseen by the MRA, and a condition of the various lease approvals and Mine Development Contracts) is largely untested, with only the Misima mine having been through a planned closure process in recent times. While the mine-site and waste dump rehabilitation on Misima has produced a heavily vegetated landscape and nascent ecosystems (albeit much altered from its original form and ecological composition) within a decade of closure (Barrick newsletter), managing the social sustainability side of closure has been less successful (Byford 2001). This underlines the need for community participation and consultation as integral components of the mine closure planning process.

### BOX 6.3: CASE STUDY - BIODIVERSITY OFFSETS AND THE PNG-LNG PROJECT

The PNG-LNG project has, in consultation with local (Mama Graun Conservation Trust) and international NGOs (including Conservation International) and the PNG DEC, developed a biodiversity strategy for the project that applies an internationally recognized hierarchy of biodiversity actions of 1) identify, 2) avoid, 3) mitigate and 4) offset. From 2011, the project began developing a Biodiversity Offset Delivery Plan to offset residual project impacts that could not be avoided or mitigated.

The project uses a definition of biodiversity offsets from the Business and Biodiversity Offsets Programme: 'Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from construction after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity' (cited in Nelson and Valekai 2014).

‘The PNG-LNG Biodiversity Offset Delivery Plan is based on a set of guiding principles in line with the IFC Performance Standards. The offset program includes several components. On-the-ground conservation gains are planned through a combination of strengthening existing protected areas and establishing new protected areas. These activities are supplemented by work at the regional level to support PNG DEC in developing a protected area system in the area surrounding Project operations (the Kikori River Basin), and work at the national level to support PNG DEC in enhancing implementation of the country’s commitments under the Convention on Biological Diversity. The program also includes a capacity building component to deliver a skills base of qualified and experienced professionals who can contribute directly to the program and also benefit the practice of conservation in PNG more broadly.’

‘EHL has made a commitment to the program for the life of the PNG LNG Project, and progress will be subject to on-going reviews and both internal and independent performance monitoring. ...It is drawing on the expertise and experience of, while also helping to strengthen capacity and networks among academics, government officials in PNG DEC and some of ExxonMobil’s own leading environmental experts from around the world’ (Nelson and Valekai 2014).

The program also has a broader capacity building component, with a partnership with the University of Papua New Guinea to support a conservation management course at the post-graduate level. Mama Graun will provide and administer scholarships for conservation courses at the university. While it will be some time before the conservation outcomes of the project are likely to be felt, its broad approach should help to overcome potential PNG-specific issues such as enduring landowner commitment and broader structural challenges.

*Source: Nelson and Valekai 2014.*

## 6.6 SUMMARY

The environmental aspects of extractive industries are the most obvious and controversial elements of these operations, and pose potential negative effects on the opportunities for sustainable human development of significant local and regional populations. Large-scale mining in particular, requires the transformation of landscapes (often mountains) into ore, tailings and waste rock, and requires significant infrastructure around it. Given the immense scale of this transformation, new technologies and management systems are limited in alleviating many of these impacts. Biodiversity offsets hold the potential to deliver positive environmental and biodiversity outcomes from projects, but this is such a new concept in PNG that judgment needs to be reserved regarding its value.

The Ok Tedi and Bougainville cases clearly illustrate how environmental devastation from the sector is not only huge and damaging in terms of progress towards sustainable human development goals for adjacent communities, but it also poses a significant risk to all stakeholders, including the State, the extractives sector, community and the companies. It is in this sense that the notion of ‘trade-offs’ between the natural capital (the environment) and developmental imperatives (increases in financial and human capital) becomes important in the PNG context.<sup>31</sup> The environmental governance policy regime, as outlined

above, provides a solid basis on which the environmental costs can be weighed against economic and social gains, but this potential is not currently apparent given the poor resourcing and weak capacity within the regulatory bodies charged with advising on and controlling the environmental aspects of these extractive sector developments. In view of the low level of education and health status within the country, investing in human capital is necessary. It has two advantages: first it will improve human development by expanding the options of people, and second it will increase the quantity of human capital which can serve as a partial substitute for the natural capital, thus protecting the nation’s overall wealth.

This Report argues that sustainable economic growth requires close attention to environmental aspects and concerns, (the environmental case for more sustainable growth). **Environmental sustainability is an end in itself, and yet environmental sustainability also supports the social case particularly in contexts such as Papua New Guinea where the bulk of the population are still heavily dependent on the natural environment for a wide range of economic, social and cultural practices.** In this sense, environmentally destructive practices can have a severe negative impact on communities, their livelihoods, social cohesion, and prospects for sustainable human development. This then leads to the business case of good environmental performance, which can assure continued investment, return and above-mentioned economic and social opportunities.

<sup>31</sup> One way to make obvious the environmental trade-offs is through environmental valuation – and particularly the use of ecological economics to place a value on the environmental resources lost as a result of the extractive industry operations. This has not been done in Papua New Guinea in a rigorous way, but as an indicative example, the estimated 2,000km<sup>2</sup> of rainforest lost to Ok Tedi’s waste would have an approximate value of up to K2billion if valued in line with existing rates of compensation paid at other mine sites in the country.

# CHAPTER 7

## Moving Forward: Extractive Industries and Inclusive, Sustainable Human Development in Papua New Guinea

### 7.1 INTRODUCTION: HOW EXTRACTIVE INDUSTRIES CAN CONTRIBUTE TO A PAPUA NEW GUINEAN VISION OF SUSTAINABLE HUMAN DEVELOPMENT

*Sustainable Human Development: 'means we develop an economy that provides all the elements for wellbeing of our citizens in a manner that is self-perpetuating' (PNG National Strategy on Responsible and Sustainable Development, 2014).*

This chapter outlines how, in the context of the above policy, the extractive industries (EIs) can better contribute to 'all the elements of wellbeing' (such as health, education, environmental protection and opportunities for economic engagement) for all citizens in a sustainable way. It opens with a discussion of the key trends and issues. This then sets the ground for the development of key policy options, organized around the framework provided by the UNDP Strategy on Extractive Industries and Sustainable Development (see Figure 7.1, below) and illustrated with case studies from other nations that have adopted these approaches and policies.

The key question of this chapter is: **what types of policy options are available to enhance the contribution of the EI to sustainable human development?** The Report does not provide detailed sector-specific policy options – such as for health, education, employment etc. – as an exhaustive list would go beyond the scope of the analysis. Rather, **the chapter aims to provide options and implications that cut across all development and government sectors.**

Given the imminent PNG-LNG-led economic boom (with GDP growth expected to top 20 per cent in 2015) there is an urgent need for the Government of Papua New Guinea to make clear policy choices around the approach to this boom. The choices below aim to assist the balance between the three pillars of sustainable development to help achieve the country's developmental Vision as expressed through its various policy documents.

Papua New Guinea's experience as a resource-dependent nation is an important starting point for thinking about ways forward. This experience highlights the trade-offs between the economic gains from the industry (and the expectations of development tied to this), and the actual economic, social and environmental impacts on people's lives that it contributes to. Since Independence in 1975, over K150billion (US\$60billion in 2014 terms) worth of natural resources have been exported from Papua New Guinea, yet 40 per cent of the population still experience significant hardship in their lives, a number that is largely unchanged since 1996.

Papua New Guinea has developed a clear set of developmental visions and plans for the use of these natural resources to transform the economy and livelihoods of its population. To date, the translation of this resource wealth into significant, inclusive

and sustainable improvements in human development has been slow. This is in line with much international experience from other resource-rich developing nations, where the diverse effects of a 'resource curse' have occurred. In particular, the above review highlights institutional weakness in Papua New Guinea – and specifically the poor capacity of line institutions to deliver quality basic services to the rural-based majority – as a central feature of this phenomenon.

Sustainable Human Development is multifaceted and complex at the best of times, bringing together a range of dimensions that raise (or at least do not diminish) standards and people's choices and opportunities currently and in the future. In the context of Papua New Guinea the concept is further complicated by the huge diversity and inequalities of access that exist across the country, within provinces and even within communities.

The issues are complex. **There are potential synergies between the social, environmental and economic elements of human development in the context of resource development, and yet often clear decisions have to be made concerning trade-offs between these different elements.**

While many issues and challenges arise for all resource dependent nations in terms of managing their natural resources, there are also proven options and strategies that can be adopted to better link extractive wealth with improvements in levels of Sustainable Human Development.

In terms of the economic pillar of sustainable development, the first post-Independence Mineral Policy developed in 1977, was 'premised on the view that large mines are useful not for any direct benefits that they bring, but for the financial support they provide for progress towards other national goals' (PNG Department of Finance and Planning 1977:2). This belief, which provides a vision of the extractive industries that is centred on the sector being the engine of economic growth, remains largely the case today. The data available shows that up to 2013 the Papua New Guinean state had received K18billion in taxes, royalties and dividends (equivalent to around 12 per cent of the value of minerals exported) (BPNG 2013), and these revenues had underpinned the government's development expenditure over the period since Independence, reducing a reliance on aid and allowing for greater economic independence. While this vision has often been pursued, it has arguably not paid sufficient attention to the social and environment effects of the industry on more sustainable forms of development.

In terms of the other 'pillars' of sustainable development, though, policy has often been less clear, and certainly less effective. In the context of the resources sector in Papua New Guinea, social aspects of sustainable development raise questions of equity,

inclusion and empowerment, and a major issue is that of ownership over mineral resources. The strong connection to land in Papua New Guinea means resource owners (generally landowners) often find it difficult to support the official position that all sub-surface minerals<sup>32</sup> are the property of the State.

Other innovations in the policy sphere have certainly opened new spaces for participation in large-scale extractive industries. The Development Forum (Chapter 3) is important especially when such negotiations reserve a place at the negotiating table for women and other marginal groups. This has occurred in relation to the 2014 renegotiations of the original Memorandum of Agreement (MoA) at Porgera and other resource projects. The reservation of a share of the Community Mine Continuation Agreements (CMCAs) benefits for women, and the support for the establishment of

women's associations at most projects are also positive signs, but they all occur against national and provincial policy frameworks that are largely silent on questions of representation, inclusion and empowerment.

One of the clearest set of social issues created by the revenue wealth at the local level has been increasing fragmentation and disputes within communities, as discussed in Chapter 5. Recent policy initiatives in this area (and especially the recent use of Benefit Sharing Agreements) have tended to increasingly politicise rather than mitigate these issues. There are also equity considerations as even the more progressive locally negotiated agreements (Box 7.1 below) can create inequality between and within communities, often lack a focus on sustainable human development, and can divert attention from provincial and national level development

## BOX 7.1: CASE STUDY - LOCALLY CONTROLLED DEVELOPMENT: THE CASE OF THE LIHIR SUSTAINABLE DEVELOPMENT PLAN (LSDP)

In terms of locally controlled social development, the case of Lihir is potentially instructive. Here, the revision to the original negotiated Integrated Benefits Package (IBP) that was agreed in 2007 (as IBP2) provided funding for the Lihir Sustainable Development Plan (LSDP). The initial funding was set at K20m per annum (and included a CPI-adjustment, so the 2014 IBP2 Grant for the LSDP is approximately K32m) paid by Lihir Gold Limited (LGL). The LSDP consists of seven chapters, each of which has elements of local control:

- Chapter 1: Funding for social projects and programs (shared benefits), half of which is managed directly by the Lihir Mine-Affected Landowners Association (LMALA), and half by LGL. This includes a range of community projects and programmes in areas such as health, education, law and justice, spiritual development etc.
- Chapter 2: Affected Area Funds (direct compensation payments/land payments to landowners).
- Chapter 3: Funding for community infrastructure (shared benefits). Managed by LMALA, although originally this was to have been managed by a local government Special Purposes Authority (SPA).
- Chapter 4: Funding for non-mining economy (shared benefits). Managed by LMALA.
- Chapter 5: Funding for mine closure (landowner trusts).

Approximately the same level of funding that is provided for under the IBP2 Grant is also expended against a further set of supplementary community-level agreements (for a total annual 'community' spend in excess of K50m). Several of these supplementary agreements have arisen due to the ability of the landowners to demand payments in addition to the IBP2 grant, or outside of the IBP2 Agreement (as this was originally intended to be an 'all encompassing and comprehensive agreement').

The LSDP does create issues in terms of overlap with the local level government, and has encountered issues with management and capacity to implement (highlighting the fact that institutions, governance and accountability are equally important within community organisations), nevertheless the LSDP does provide a framework for a high degree of local autonomy and control in terms of the potential for translating resource wealth into locally meaningful forms of human development.

<sup>32</sup> Or at least those below 6metres in the case of hardrock minerals, a legislative change introduced in the 1990s.



The policy environment around resources and development has been weakest in terms of the *environmental pillar* of sustainable development. Generally environmental legislation is quite progressive and can potentially be used to mitigate the worst effects of mining and other resource extraction. Hence developers are required to prepare their own Environmental and Social Impact Assessments, and there is certainly scope for the Minister to call for changes or even to refuse to grant the required licenses if the impacts are considered to be undesirable. To date this has not occurred. In the case of both Bougainville and Ok Tedi the efficacy of the environmental legislation and governance regime was not tested as each of these early, environmentally destructive mines was developed under specific Acts of Parliament, and did not fall under the scope of the existing environmental regime. Other mines have also come under external criticism for their environmental effects – Porgera and Tolukuma for their riverine tailings disposal, and Ramu, Lihir and Misima for their DSTD. The governments' response to these criticisms has been somewhat haphazard until recently. There is currently a Constitutional and Law Reform Commission review into tailings disposal in the mining sector that is examining the effects of current practice and seeks to ensure the optimum protection of the country's environment and its people and aims to modernise tailing management practices. This is occurring alongside a review of the current Mining Act that is also considering environmental management practices as part of a wider review of the Act. It may be fair to conclude that the environmental dimension of the extractive industries in Papua New Guinea (as elsewhere) remains the most challenging.

The scale of activity is an important consideration in terms of the contribution of resource industries to human development. Overall, the positive contribution of smaller-sized mines to human development tends to be much more localized, and on a smaller scale than for the larger operations, and their shorter project life generally mitigates against more sustainable community contributions. On the other hand, their environmental footprint is typically much smaller. In terms of sustainable human development, there are also a number of differences between the loosely or largely unregulated artisanal and small-scale mining (ASM) sector and the large-scale mining operations. There is a more direct relationship between returns from the ASM sector and household incomes, but labour is largely unregulated, and there are concerns about children working in the industry. The widespread, unregulated use of mercury (up to 4t per annum in Papua New Guinea) in ASM pollutes waterways and can cause devastating health issues. The environmental effects of small-scale mining are also far less regulated than the large-scale sector.

Any discussion of policy toward, and governance of, the extractives sector is required to recognise that while the policy and legislative framework (from the Constitution down) clearly advocates for the consideration of more than just the economic factors of natural resource use, the limited capacity (and on occasion political will) to implement policy and monitor and regulate activities in the sector is a significant obstacle. The **economic benefits of good governance are clear** (and discussed further below) and there is already a high degree of transparency and good governance around most aspects of the financial flows and economic contribution of the sector at the national level. Outside the economic sphere however,

the ability of the state to provide checks and balances over the extractives sector are limited. Arguments around the capacity to effectively regulate have been made with regard to the Department of Petroleum and Energy (DPE), and the Department of Mineral Policy and Geohazard Management (DMPGH). Chronic resourcing and capacity constraints on the Department of Environment and Conservation (DEC) limit its ability to assess, monitor and regulate these operations. Senior public servants connected with the former, along with some from the Mineral Resources Authority (MRA), have also been implicated in investigations into questionable practices around the issuing of licenses and development funding. In sum, the State's capacity and ability to monitor and regulate the social and environmental aspects of these significant economic components of the formal economy has been low. Given the critical importance of the extractive industry to the country's development, it is important that regulators are provided with the necessary resources to ensure that the sector performs in ways that it should in all areas, to enhance its potential contribution to sustainable human development.

**An important limitation in any discussion of local impact of extractive industries in Papua New Guinea is that it is rarely based on good evidence and data.**

At the local level, Lihir is the one resource project site where there is good long-term socio-economic data available that can confidently show trends in different aspects of human development over the almost 20 years that the mine has been operating. In short, this shows that: the local economy has expanded significantly, and incomes have risen dramatically; the population of the island has increased in part due to migration; that most of the indicators of the health status of the population have shown improvements (including MMR, IMR and life expectancy); and that levels of education participation have likewise increased significantly. On the flip side, law and order problems have escalated, some health issues have become more prominent ('lifestyle' and non-communicable diseases, alcohol abuse and HIV/AIDs), and there is community-level concern at changes in cultural practices. The lack of social monitoring and longitudinal data in relation to the local impact of extractive industries is now also being addressed through the large-scale data collection and monitoring project being carried out by the Institute of Medical Research (IMR) in areas affected by the PNG-LNG project (as well as two control areas).

The history of the minerals sector in Papua New Guinea shows that communities (and the nation) are willing to accept some level of environmental damage and social dislocation in exchange for economic benefits/growth. **A key issue is ensuring that those most directly affected are centrally involved in these decisions around such trade-offs.** In light of this, it is fair to ask whether the environmental and social problems at Ok Tedi could have been mitigated, although perhaps not entirely avoided, if the downstream communities who received the mine's waste had of been involved in the decision-making processes from the start. Any resource development involves social, economic and environmental risk for communities, corporations and the country as a whole. A significant part of making these developments more inclusive and sustainable is to allow for greater participation of those likely to be exposed to these risks in the decision-making process, as well as providing them with the knowledge and resources to make well-informed judgments. Inclusivity needs to be built in from the start

of deliberations around resource development plans.

The idea of trade-offs between the different pillars of sustainable development can be developed further though by considering what opportunities there are **to promote practices and policies that provide for the potential for improvements in all areas of sustainable development**: that is, where the cross-linkages between social, economic and environmental policies and practices provides for sustainable and inclusive long-term growth. At the national level, for example, the international evidence is that a healthier and better-educated population will be more economically productive and more likely to exhibit greater concern for environmentally sustainable practices.

In terms of the resources sector we can identify a potential nexus at the local level between better local community development programmes (of a participatory nature and carried out in collaboration with government or others), improved social and environmental management, and less conflict, better corporate returns, and more sustainable improvements in the human development of the local population. Sound environmental management can save money in the long-term, and provide for more sustainable forms of long-term inclusive growth. Likewise, improvements in grievance processes and mechanisms (and particularly the institutionalization of these) can go a long way to alleviate conflict and reduce risk and costs for operators and communities.

Initiatives such as the Oil Search Health Foundation and the PNG Industry Malaria Initiative (PIMI), through addressing health problems in the communities surrounding the operations, do improve the health of local employees. They also help provide support for the corporation's 'social license to operate', and contribute to improvements in the lives of those in the community. These win-win examples are demonstrations of the motto 'doing well by doing good', and show that positive cross-linkages are possible: the challenge is to extend this thinking into other aspects of resource operations.

There are important differences identified in the above chapters between and within the different extractive industries. Broadly speaking, large-scale mining performs better in Papua New

Guinea in terms of developing and sustaining local employment and local business given the higher local content of on-going contracts and operational costs, but historically its environmental effects have been much broader in extent, often permanent, and more destructive. Gas, while offering very low levels of on-going employment, has a much more benign environmental impact and is likely to generate less volatile revenue flows for the government once these revenues are initiated. Each type of resource (and indeed project) also presents a different set of governance challenges. The high flows of tax revenue from the oil and gas sector, for example, mean that pressure is applied to institutions to manage these flows in prudent ways, and to limit the dangers of corruption.

## 7.2 A FRAMEWORK FOR POLICY OPTIONS AND CHOICES

In addition to the experiences with natural resource development over the past 40 years of both Papua New Guinea and the international experiences, the other element that has shaped the development of the policy options is the need to think about a '**Papua New Guinea model for natural resource-based development**' and even to think about a Papua New Guinea development model independent of extractive industries. One of the challenges for the government and for the people of Papua New Guinea more generally is to identify what exactly such a model may look like. It will need to be one that incorporates the relevant elements of international experience into what are seen as the essential elements of a Papua New Guinean vision for development, and consideration of the implications of this for the extractives sector. Discussions and learnings at the regional level (see Box 7.2) can usefully inform this.

Internationally there are some good examples and analysis available: the major message is that effective institutions matter (for distributive aspects, and in terms of regulation), and changing established patterns can be difficult (path dependency), but is vital if different outcomes are desired: different outcomes cannot be expected if the same policies continue to be practiced.

### BOX 7.2: A PACIFIC PERSPECTIVE ON EXTRACTIVES AND HUMAN DEVELOPMENT

Experience from other parts of the Pacific (Timor Leste, Nauru, New Caledonia, Fiji) is often of particular relevance to Papua New Guinea. The extractive industries in the region has been discussed at Regional forums (such as the 2013 Nadi UNDP Regional Symposium on Managing Extractive Industries in Pacific Island Countries to Improve Human Development – see Box below – and the Secretariat of Pacific Countries (SPC) -sponsored 2011 Mining and Mineral Policy in the Pacific Conference in Noumea). These events have provided opportunities to reflect on the applicability of developments in extractives sector in the region as they may relate to Papua New Guinea.

The 2013 UNDP Regional Symposium produced a set of principles relating to extractive industries that combine elements of the above international experience with Pacific experience in the area. These principles include:

- Resource revenue should be used in ways that promote locally-derived and equitable human development priorities, and balance current needs with those of future generations.
- Extractive industries should be managed to maximize opportunities for employment and education as well as well as promote the development of diversified economic activities to enhance cash flows and GDP.
- Governments should seek to ensure extractive industries lead to improved human development by adopting appropriate transparency and accountability mechanisms and policy and legal frameworks across all stages of extraction to guide and manage the extractive sector fairly and effectively, including for the collection and use of revenue.
- Governments should exercise a lead facilitation role by helping develop governance mechanisms through participatory methodologies that entail on-going constructive conversations between governments, the private sector, communities land-owners as well as relevant civil society organizations.
- On-going constructive consultation between stakeholders (especially prior to commencement of any extractive developments) is crucial to ensuring: a) the establishment of effective conflict resolution mechanisms, b) harmonized relationships, c) better co-ordination between government and key stakeholders, d) sustainable agreements, and e) improved human development outcomes due to exceedingly complex land tenure and land ownership in the Pacific.
- Management of extractive industries should try to minimize negative impacts on the community through the adoption of policies and programmes that ensure environmental and social sustainability, equitable distribution of benefits, respect for gender equality, human rights, the cultural heritage and the diversity of the Pacific, as well as adequately compensate communities most affected by resource extraction (hence defining fair shares for each stakeholder).
- Extraction projects in the Pacific should be developed only if it can be demonstrated that they will not unduly harm the natural environment. Strong regulatory regimes should be put in place to assess and monitor projects. A sustainable development approach must be considered, highlighting the corporate social responsibility of investor's pre- and post mining activities.

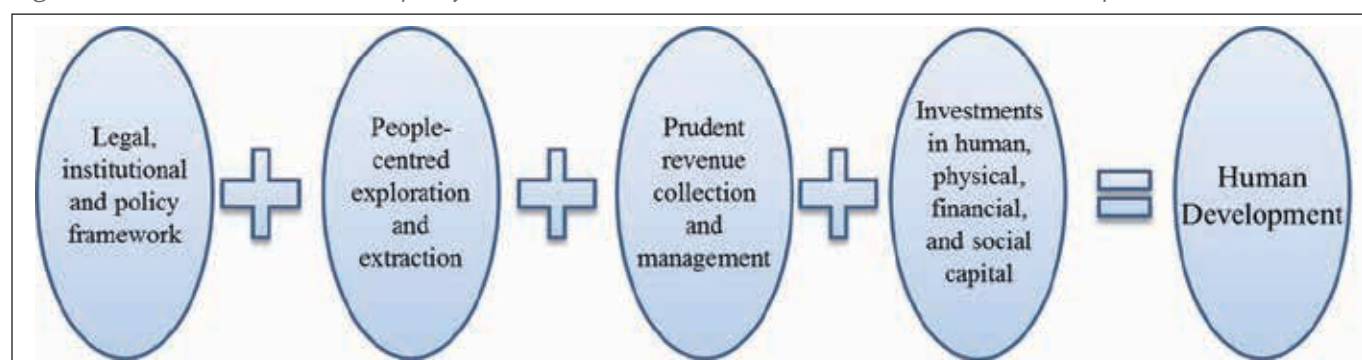
The **UNDP Strategy on Extractive Industries and Sustainable Development** provides a framework for organizing policy options to promote better human development outcomes (see Figure 7.1 below). Within each of the four critical points of policy intervention, attention is directed at policies that relate to one or more of the three 'pillars' of sustainable development: the framework then is useful for thinking about options to increase the level of integration and cross-cutting linkages between these 'pillars'. At the heart of the issue is the fact that the economic, environmental and social impacts of mineral extraction are complex, multi-faceted, and easily politicised. Debates about extractive industries are often highly polarised and tend to focus on an overly narrow set of

*"The future I want is for our government to work together with the United Nation and other organisations and help develop our country so our people can benefit"*

HAGAR MALISO, 18 YEARS OLD

issues, usually taxation and sometimes just on royalties. A focus on sustainable human development requires a wider set of issues to be addressed.

Figure 7.1 UNDP's Framework for policy on Extractive Industries and Sustainable Human Development



Source: UNDP 2012

Table 7.1 Summary of Policy Arenas, Issues and Options

Policy Arena	Policy Issue (and chapter reference for discussion)	Policy Options
<p><b>Legal, institutional and policy framework</b></p>	<p>Good governance and accountability (Chapters 2,3,4,5,6)</p>	<p>Continue to improve sub-national government service delivery. May require tighter integration of Service Improvement Programme (Provincial Services Improvement Program (PSIP), District Services Improvement Program (DSIP), Local Level Government Services Improvement Program (LLGSIP)) and discretionary budget funding with development and recurrent budgets, and relevant planning, budgeting and accountability mechanisms at provincial, district and local levels.</p> <p>Review proposals to establish further administrative structures in terms of existing capacity and systems.</p> <p>Consider and if appropriate trial novel ways of improving sub-national revenue flow transparency, management and service delivery.</p> <p>Revisit policy around Development Forums and BSA negotiations to integrate with existing planning processes.</p>
	<p>Negotiation capacity of the Government vis-à-vis private sector and multinationals (Chapter 3)</p>	<p>For any future negotiations (or renegotiations) regarding resource developments, look to draw on regional and international expertise (such as International Senior Lawyers Project (ISLP)), as much for transparency as for any potential improvements in agreement terms.</p> <p>As part of the review of Mineral Policy, ensure there is wide-ranging and informed debate regarding State Equity in major resource developments.</p>
	<p>Mechanisms and capacity for involvement of communities in negotiations (Chapter 3 and 5)</p>	<p>Following on from the 2013-2014 review of the Mineral Policy and Mining Act, ensure that women and other vulnerable and marginal social groups are empowered to participate in, and shape, discussions of mineral policy.</p> <p>Legislate, or embed in regulation, a role for women in negotiations for new extractive resource operations. Adequate and appropriate representation in Development Forum and negotiations of BSA would be a minimum for this.</p> <p>Ensure quality Social Impact Assessment (SIA) and social mapping to identify other vulnerable and marginal groups and ensure they also have a voice in the development of new extractive operations.</p>
	<p>Mineral rights and ownership (Chapters 3 and 5)</p>	<p>Review the costs and benefits of shifting from state ownership of minerals to either a shared model, or one in which ownership is vested in landowners.</p>
<p><b>People-centred exploration and extraction</b></p>	<p>Local participation and control (Chapters 3, 4 and 5)</p>	<p>Examine locally appropriate ways of enhancing channels for local consultation and involvement at all stages of extractive industry development (including Free Prior Informed Consent (FPIC)) to build awareness, moderate expectations and reduce the potential for conflict.</p> <p>Examine mechanisms to ensure benefit distribution processes are made more equitable and inclusive of marginal groups.</p> <p>Examine the potential mechanisms by which universal or conditional cash transfers of a portion of extractive industry revenue can be used.</p>

	Grievance mechanisms (Chapters 3, 5 and 6)	Consider the establishment of a 'Mining Ombudsman' as an independent office. Improve mechanisms for handling disputes internal to the community.
	Reducing social and environmental costs (Chapters 3, 5 and 6)	Review social and environmental impact assessment and monitoring guidelines against international best practice. Follow through on the Constitutional and law reform committee review of tailings management. Examine the potential costs and benefits of employing a biodiversity offset programme for all large-scale extractive operations. Develop a strategic view of the costs and benefits of a staged approach to the development of the country's mineral resources.
<b>Prudent revenue collection and management</b>	Appropriate fiscal regime and monetary policy (Chapter 4)	Ensure stability of fiscal regime through regular monitoring and reviews. Examine mechanisms for independence and appropriate governance around the Sovereign Wealth Fund (SWF).
	Transparency of and accountability for revenue flows (Chapter 4)	Commit to move to Extractive Industries Transparency Initiative (EITI) compliant status. Look to use EITI to assist with transparency and accountability regarding sub-national revenue generation and re-allocation to provinces and districts.
<b>Investments in human, physical, financial, social capital</b>	Smart spending (equitable service delivery; social services and infrastructure) (Chapter 5)	Capitalise on existing free health and education policies by focusing on improvements in local-level delivery systems. Small incremental improvements to these will ensure lasting improvements in sustainable human development. Adopt a clear transparent Specific, Measurable, Achievable, Relevant and Transparent or 'Time-Bound' (SMART) spending framework that seeks to give effect to the Policy Frameworks and Alotau Accords. As part of this, ensure integration of corporate, civil society and donor initiatives with these plans, where appropriate.
	Inclusive employment and broader livelihood creation (Chapters 4 and 5)	Ensure that extractive industry developments address (through BSAs and Social Management Plans) how they will produce meaningful and sustainable improvements in livelihood options for local community members.
	Diversification of the economy (Chapter 4)	Increase investments in research and technology. Under the SWF, require strategic priorities and plans for the development of non-resource sectors of the economy, and require a set portion of SWF drawdowns for these sectors.
	Greater oversight of Corporate Social Responsibility/Community Development Activities (Chapter 5)	Consider legislating for a minimum commitment of CSR. Integrate these activities more closely with national, provincial and local planning processes.
	Data (especially Chapter 5)	Give consideration to enhancing government capacity and resources to carry out or require the accurate and timely data collection on the local-level effects of the sector on social, economic and environmental aspects of human development. Consider mechanisms and requirements for development of relevant, timely and easily applicable HDI measure at sub-national levels.

## 7.3 POLICY ARENA 1: LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK

### GOOD GOVERNANCE AND ACCOUNTABILITY

Having a set of appropriate, accountable and effective institutions is regarded as one of the key factors that can ensure the translation of natural resource wealth into inclusive and sustainable forms of human development.

Analysis of policy and legislative frameworks, decision-making processes and governance arrangements in Papua New Guinea has demonstrated that this is an area where there is a great deal of work required, notwithstanding the recent improvements in many aspects. Small improvements will reap the largest returns in terms of human development outcomes.

Three specific issues have been identified as part of the discussion in previous chapters, all of which are concerned with the more effective translation of national resource revenue into sub-national planning and processes for improving sustainable human development at local levels.

First, there is a need to continue improvement in sub-national government service delivery, including accountability mechanisms, building on recent initiatives such as the NEFC Performance Expenditure Review, and the Department of Health Sector Performance Annual Review processes. One particular aspect of this would be to require tighter integration of DSIP, LLGSIP, PSIP and discretionary budget funding with established planning and

accountability mechanisms at provincial, district and local levels.

A related aspect is the need to examine closely and critically proposals to establish further administrative structures (such as District Development Authorities) at local levels, in terms of the existing available capacity and management at these levels and integration with existing planning and implementation systems, and with the DSIP processes. Currently accountability and transparency at this level of government is poor, and devolution of further responsibilities and resources without appropriate improvements in oversight creates both conditions for greater levels of corruption and a disconnect with strategic provincial and national planning.

Current processes around Development Forums and BSAs (which are regulated under the Mining Act and the Oil and Gas Act) are not well integrated with existing Local-Level, District, Provincial or National Level Planning Processes. Hence the resulting commitments often do not fit with the priorities, needs and plans identified by these other processes. In this sense, Development Forums and BSA negotiations should be required to tie in more closely to these existing planning processes at all levels to enhance the effective delivery of services for improvements in human development.

Improving institutions and governance also involves improvements in the management of resource wealth and transparency (both addressed below under 7.5)

## BOX 7.3: CASE STUDY - CHILE AND RESOURCE GOVERNANCE

Chile is the largest copper producer in the world, supplying 43 per cent of world copper exports. The way that it has managed this resource has evolved considerably through time. Since the nationalization of large-scale copper mines in 1971, the Chilean government has gone over a long history of building reputation, legal institutions, and policy improvements. The Mining Code of 1983 enabled the necessary rules of sharing the rents between the sovereign state and the private investor to be transparent and carefully designed.

Following the recent copper price boom, the government set up a Fund for Innovation for Competitiveness, which is funded from royalty payments and administered by the Ministry of Economics. There is a National Council of Innovation for Competitiveness that advises the President of the Republic with proposals on human capital development, dissemination of technologies and innovation policies. In addition, the government also implemented the Fiscal Responsibility Law, which included the creation of two Sovereign Wealth Funds (SWFs). These are, the Fund for Social and Economic Stabilization (FESS) to help overcome fiscal deficits when copper revenues decline unexpectedly and the Pension Reserve Fund (PRF) to help finance pension and social welfare spending. The two funds' respective investment rules are designed to reflect their different objectives, avoid conflicts of interest and prevent excessive risk-taking. The funds are very transparent. Information on fund managers, returns on specific investments and even how deposits and withdrawals are calculated is all publicly available.

Central to this have been refinements in the linkages between local and national levels of government, and improvements in the quality of governance at the local level alongside those at national levels.

Chile not only succeeded in managing revenues in a transparent and accountable manner, it has managed to diversify its economy away from mining (as discussed further below).

*Source: Revenue Watch and Vale Columbia Centre (2014)*

## Principle:

There is a need for transparent and accountable institutions, capable of managing the translation of resource wealth into sustainable, equitable improvements in human development.

## Policy Options:

1. It is vital to strengthen the links between national and sub-national levels, and to improve sub-national service delivery, including accountability mechanisms. This may require tighter integration of Service Improvement Programme (PSIP, DSIP, LLGSIP) and discretionary budget funding with development and recurrent budgets, and relevant planning, budgeting and accountability mechanisms at provincial, district and local levels.
2. Establishing further administrative structures (such as the District Development Agencies) could in some circumstances be beneficial for better delivery of services at local level. The risks however are that it can break an already stretched capacity and management. Integration and coordination with existing planning and implementation systems is essential.
3. Consider and if appropriate trial novel ways of improving sub-national revenue flow transparency, management and service delivery. These may include encouraging self-nomination of MPs to pilot transparency and accountability projects in their Districts (in a similar way to the Coalition for Change campaign to enlist high profile men in the fight against violence against women). Or fostering 'demand side' accountability by investing in capacity development for credible civil society organisations so as to allow them to become more involved in ward- and district-level planning and expenditure monitoring processes. Or trialling of high-profile Citizen or Community 'Report Cards' that provide a qualitative monitoring and evaluation tool for citizens or communities by which they can, in a public way, assess the performance of service delivery agents.
4. Revisit policy on Development Forum and BSA negotiations to ensure they are carried out within a framework that explicitly situates these negotiations around existing district, provincial and national plans and processes (including monitoring and evaluation). Coordinating the outcomes of Development Forums and BSA agreements more closely to existing planning processes at local and national levels is vital to improvements in people's access to basic services at all levels.

### NEGOTIATION CAPACITY OF THE GOVERNMENT VIS-À-VIS PRIVATE SECTOR AND MULTINATIONALS

Generally the Papua New Guinea State has shown it can exert some power in negotiations with multinationals over extractive sector developments, and the agreements, contracts and outcomes are internationally comparable (Emerson and Kraal 2014). There is still scope however, for external assistance in terms of accessing and assessing information relevant to the technical assessment of proposals. There are a range of possible sources, including regional information sharing and initiatives (such as the 2013 UNDP regional symposia on extractives, and SPC-led sea-bed mining policy initiatives), and potential international organisations (such as ISLP, as discussed in Box 7.4 below). Even if the outcomes of the various contracts and agreements are not changed significantly, the involvement of external experts can provide a great degree of confidence in the process for citizens.

Contract negotiations also involve consideration of the State's position on government equity in these extractive operations. While the Mining, and Oil and Gas Acts describe current state policy

(up to a maximum of 30 per cent and 22.5 per cent, respectively), the actual share and the form that this takes varies significantly between each of the operations (from effectively zero through to 100 per cent). There are certainly pros and cons associated with state equity, which have been well rehearsed internationally (World Bank 2011) and in the context of Papua New Guinea (Daniel et al 2000, Emerson and Kraal 2014). The advantages include; being party to direct potential 'windfall' revenues if commodity prices spike; access to information and decision-making regarding the resources; and, a means to express a nationalistic sense of 'resource ownership'. The disadvantages of this position is that it creates a conflict of interest with the state's role as regulator; it typically includes high up-front costs (US\$310million in the case of the PNG-LNG project); and exposes the State to the risks associated with the vagaries of the economics of the sector. As an example of these disadvantages, the State's initial 30 per cent share in the Ok Tedi operation provided no substantial economic return for at least 15 years, and led to a clear conflict of interest between its economic stake and its role as environmental regulator with devastating environmental and social consequences.

## BOX 7.4: CASE STUDY - SUPPORTING NEGOTIATING CAPACITY: INTERNATIONAL SENIOR LAWYERS PROJECT (ISLP)

The International Senior Lawyers Project (ISLP) provides pro bono services of highly skilled and experienced lawyers to promote human rights, equitable and sustainable economic development and the rule of law worldwide. Over the past seven years, ISLP has developed a program to assist governments of least developed countries manage the use of their extractive sector wealth.

In 2006, in response to the immense needs of post-conflict Liberia, President Sirleaf announced that her government would review all of Liberia's concession agreements, including the country's two largest concession agreements: ArcelorMittal and Firestone agreements for iron ore and rubber extraction, respectively. ISLP, along with other outside support, provided pro bono technical services in contract revision for the Government of Liberia. The ArcelorMittal agreement had some 30 improvements over the original contract and the Firestone amended contract had nearly 40 improvements. As a result of the re-negotiations, ArcelorMittal increased the company's investment in Liberia from USD\$1.0billion to USD\$1.5billion. The improvements covered gains against transfer pricing, taxes, duties, the agreement term, corporate governance, infrastructure ownership, value added manufacturing, sovereignty issues, environmental matters and gains in social benefits including housing, water and sanitation, education, requirements for Liberian employment and training, and community obligations.

The ISLP has advised the Government of Liberia in the negotiation of three major concession agreements that will increase concession investment by USD\$3.5billion. ISLP has also provided its pro bono services in the management of natural resources to Sierra Leone and Tanzania. In Sierra Leone, ISLP is helping the Government review key mining contracts and assisting officials in discussions with mining companies. In Tanzania, ISLP has provided support in training for review and drafting of natural resource laws. ISLP's services in the extractive sector have resulted in benefits ranging from increased royalty and tax payments to enhanced corporate governance, environmental protections and improved services and benefits for the local communities.

Sources: [http://www.opensocietyfoundations.org/sites/default/files/liberia\\_20090302.pdf](http://www.opensocietyfoundations.org/sites/default/files/liberia_20090302.pdf)  
<http://islp.org/content/focus-equitable-economic-development>

### Principle:

State involvement in negotiations with potential investors for access to the country's resource wealth needs to be based on strong technical expertise, adequate levels of information and with a clear sense of what the state wants from the resource development – how it fits into the broad development vision for the country.

### Policy Options:

1. For any future negotiations (or renegotiations) regarding extractive sector developments, look to draw on regional and international expertise (such as ISLP) to strengthen the State's information and expertise base, as much for transparency of process as for any potential improvements in agreement terms.
2. As part of the review of Mineral Policy, ensure there is a wide-ranging and informed debate regarding the costs and benefits of State Equity in major resource developments. This can then be used as a guide in future negotiations to reduce the scope for ad hoc political decision making regarding each successive development.

<sup>33</sup> Although in the Porgera negotiations the developer (Placer Pacific) was not a signatory to the agreements that resulted from the Development Forum, in each subsequent set of negotiations the developer, the state and lease landowners have all been signatories, West 1992, and Filer 2012..



## MECHANISMS AND CAPACITY FOR INVOLVEMENT OF COMMUNITIES IN NEGOTIATIONS

The original Porgera Development Forum, a tripartite set of negotiations between lease landowners, provincial and national government, and the mine developer<sup>33</sup>, represented a major step – advanced by global, not just developing world standards – in having local landowners play a major role in the negotiations around the development of a large-scale gold mine. This became a precedent for all subsequent resource developments in the country. In a broader sense, the 2013-2014 process of reviewing the existing Mineral Policy and Mining Act has also sought to involve (through public fora) a broader range of inputs into the policy process than the sector had previously enjoyed.

However there is still a need to improve and broaden the mechanisms by which a wide range of voices can be brought into the negotiations and discussions around policy, as well as be involved in negotiations for individual resource developments. This involves examining the mechanisms by which marginal and vulnerable groups (including women, youth, the poor, and disabled) are given voice (or a seat at the negotiating table) and providing them with the capacity (through technical assistance) and confidence to effectively evaluate policy proposals, business propositions, and impact assessments.

One way to facilitate engagement of a broader range of beneficiaries or landowners in the early negotiations for new developments is to strengthen the capacity of government and/or civil society to work with and support these groups. This might include working with the groups to research and prepare submissions, assess

proposals from the state or the developer, and if necessary access additional expertise.

Additional mechanisms that can fall into this policy arena include examining the mechanisms by which different groups are compensated, and to push for greater emphasis on non-cash forms of 'compensation' that can better spread the distribution of benefits to support more sustainable aspects of human development (such as improvements in health and education facilities). Following from this, there is also a need for greater levels of accountability of all parties to the social contracts that these agreements contain with communities affected by resource developments. This accountability in turn requires much more institutionalized forms of monitoring and evaluation, tied to local-level planning processes.

These more inclusive forms of development require all to have a voice – and especially women and children, given the analysis in previous chapters. These innovations could be mandated in legislation or regulation, or simply be policy with regard to Development Forums and BSA negotiations. This is the direction mineral resource governance needs to go to protect and enhance rights says Macdonald (2014:39) in a report for UNICEF. While such a high and broad level of community participation in policy and site-level negotiations is relatively rare in the developing world (and indeed in many parts of the so-called developed world), the experience in Papua New Guinea is that corporations would welcome this, particularly if it was clearly associated with reducing the exposure of their operations to protest and violence from communities.

<p><b>Principle:</b></p>	<p>Inclusive forms of growth require that all community members – including marginalized and vulnerable groups – have a say in the process of negotiating both policy and new extractive developments.</p>
<p><b>Policy Options:</b></p>	<ol style="list-style-type: none"> <li>1. Following on from the 2013-2014 review of Mineral Policy and the Mining Act, and in the context of the current formulation of the Sea-bed Mining Policy, ensure that women and other vulnerable and marginal social groups are empowered to participate in, and help shape, discussions of mineral policy and its implementation.</li> <li>2. Legislate or embed in regulation, a role for women in negotiations for new extractive resource operations. Adequate and appropriate representation in Development Forum and negotiations of BSA would be a minimum for this.</li> <li>3. Ensure quality SIA and social mapping to identify other vulnerable and marginal groups and ensure they also have a voice over the development of new extractive operations. Such participation can be very helpful in assisting leaders to develop clear, more inclusive plans for their areas. Having these processes open to the public can assist in terms of transparency. Clear public communications from these processes can also build awareness among affected groups regarding what their leaders are seeking to achieve.</li> </ol>

## MINERAL RIGHTS AND OWNERSHIP

There needs to be clear and appropriate understandings, and community acceptance, of the rules around mineral ownership. State ownership of minerals, as noted in Chapters 3 and 5, has been a source of contention since Independence (and unsuccessful legal challenges in the past) and is now being increasingly questioned in the Papua New Guinea context. The major issue is that Melanesian conceptions of 'ownership' integrate above ground and sub-soil resources.

The Transitional Mining Bill currently under consideration in Bougainville is attempting a new path by proposing that 'All minerals existing on, in or below the surface of any customary land in the Autonomous Region of Bougainville are the property of the owners of the customary land' (Section 13). There have also been moves since 2008 to introduce similar changes in Papua New Guinean Mineral Policy and incorporate these as amendments to the Mining Act (first introduced by Boka Kondra, MP in 2008).

There is a range of potential advantages and disadvantages to this proposal, although there is little evidence to support either side. Proponents argue that such an approach could increase returns to landowners from the resource, provide them with a veto over mineral



*Compensation Payment Lihir, 2010*

communities as do local and central government.

Principles such as Free Prior Informed Consent (FPIC) are important in protecting the rights of individuals and communities. This also needs, though, to acknowledge the different ways in which decisions are made within Melanesian societies – Macintyre (2007)

<b>Principle:</b>	For the extractives sector to be sustainable in the long-term, there is a need for a mineral rights ownership regime that balances Melanesian understandings and forms of ownership with global sector imperatives for access, certainty and security of tenure.
<b>Policy Options:</b>	1. Initiate a formal, wide-ranging, rigorous and consultative review process of the costs and benefits of shifting from State ownership of minerals to either a shared model, or one in which ownership is vested in customary landowners.

development, and reduce frustration (and conflict) at perceived inadequate returns. Critics (from industry in particular) debate whether such a proposal could actually provide enhanced returns to landowners, and the uncertainty created would stop investment in the sector. There is little relevant international experience with such a proposal, and a lack of rigorous assessment of the options and their costs and benefits.

### 7.4 POLICY ARENA 2: PEOPLE-CENTRED EXPLORATION AND EXTRACTION

#### LOCAL PARTICIPATION, CONTROL AND DISTRIBUTION

As the discussion of conflict in Chapter 5 indicates, participation of communities from the start can provide them with a greater sense of control and ownership of the project, although experience has shown that the expectations generated need to be carefully managed, as do the internal conflicts that this participation can generate. The fundamental mismatch between local expectations and what an extractive operation can actually deliver in terms of benefits is a driver of much of the social tensions witnessed around resource projects. As the case of Bougainville illustrates, local conflicts can easily escalate to national-level political battles and civil conflict, and this can threaten the continued commitment from investors. Companies have an interest in managing such expectations by establishing and sustaining dialogue with

has suggested that in Melanesia, FPIC needs to be approached in a more process-oriented and relational way than usually adopted elsewhere.

Ensuring a greater spread of access to benefits is important. As noted in Chapter 5, existing processes tend to create or dramatically enhance inequalities and produce a wealthy, often increasingly unrepresentative elite. The application of funding to support improved local services and infrastructure is critical to spreading developmental benefits more widely. A lack of access to social services, and locally perceived inequalities and poverty are drivers of conflict, and hence ensuring the effective delivery of services (locally, in addition to the national level) is an effective way to avoid conflict. In this sense the form that the distribution of benefits takes is important to building inclusive human development. Health and education services in particular (along with basic infrastructure – roads, water supply, sanitation etc.) are central elements in terms of broadening the human development effects and outcomes.

In terms of local benefit stream distribution, a move away from the typical model of royalty and compensation payments being made to male leaders is critical (and the Ok Tedi CMCA offers a model), despite claims to its customary basis. An important element of this is involvement of marginalized and disadvantaged groups in revenue distribution.

A form of localized universal or conditional cash transfers would be more participatory and certainly help with the equity element of benefit distribution. It would also ensure a greater spread of local benefits beyond local power-brokers and 'Big Men'. Conditional

their rights have been infringed or agreements not adhered to. Well-designed and supported grievance mechanisms have been shown to be effective elsewhere in terms of preventing or helping to resolve conflict.

<b>Principle:</b>	There is a need to ensure high levels of local participation in all stages of resource exploration and extraction. This will maximise the potential for improvements in human development and also minimise business risk. The goal of such participation should be to ensure that affected communities retain a high degree of control over the direction of their lives, and receive an equitable share of the distribution of benefits from the sector.
<b>Policy Options:</b>	<ol style="list-style-type: none"> <li>1. Examine locally appropriate ways of enhancing channels for local consultation and involvement at all stages of extractive industry development. The use of a locally-appropriate form of FPIC as a pre-condition for mining, and then on-going regular communication channels between state, landowners and companies could help raise awareness, moderate expectations and reduce the potential for conflict.</li> <li>2. Examine mechanisms to ensure benefit distribution processes are made more equitable, transparent and inclusive of marginal groups. Building on the Porgera royalty regime (with a component reserved for youth) and recent CMCA initiatives (with a reserved share for women may be useful. This could involve regulating for specific forms of distribution, or setting guidelines for such processes that are included in Development Forum negotiations.</li> <li>3. Examine the potential mechanisms by which universal or conditional cash transfers of a portion of extractive industry revenue can be used to spread benefits in a more equitable way at national, provincial or local levels.</li> </ol>

cash transfers derived from mining revenues are already being made in parts of New Ireland Province. While such transfers may be logistically difficult in Papua New Guinea at present, as the coverage of mobile banking is extended, it is certainly worth examining further.

**GRIEVANCE MECHANISMS**

Currently the State (MRA) manages initial grievance mechanisms (as forms of mediation), so disputes can then enter the formal court systems. The role of the State as mediator is conflicted at times, and affected communities often feel compelled to adopt other approaches to make claims (such as violence, protests, legal action or working with international NGOs) when they feel

Typically such mechanisms need to be independent, and empowered to be able to make binding decisions (that is, ensuring compliance from all parties with decisions), neither of which the current processes are effective at doing.

Such mechanisms (and more than one may well be required) also need processes for resolving and/or managing internal community conflicts around these extractive sites. Current disputes related to land are handled under the Land Disputes Settlement Act, which can be a cumbersome process. Other internal community conflicts around sites of extractive operations are dealt with under customary law or the quasi-formal Village Court system, beyond which recourse is again to the formal justice system.

**BOX 7.5: SUPPORTING NEGOTIATING CAPACITY: INTERNATIONAL SENIOR LAWYERS PROJECT (ISLP)**

Two approaches to grievance mechanisms are firstly, those that, while legally bound and enforceable, operate autonomously from the state apparatus, and second, those that place a burden of responsibility on business to protect and promote human rights.

The Compliance Advisory Ombudsman (CAO) of the International Finance Corporation (IFC) is the independent recourse mechanism for projects supported by the IFC or the Multilateral Investment Guarantee Agency (MIGA), the private sector lending arms of the World Bank Group. CAO was established in 1999 and reports directly to the President of the World Bank Group.

CAO works to:

- Address the concerns of individuals or communities affected by IFC/MIGA projects,

- Enhance the social and environmental outcomes of IFC/MIGA projects; and
- Foster greater public accountability of IFC and MIGA.

The operational guidelines for the CAO aim to provide a ‘predictable process to guide complainants and other stakeholders through CAO’s complaint-handling process.’ The CAO (headed for the first 15 years of its existence by the eminent Papua New Guinean, Dame Meg Taylor) has a reputation for being accessible and independent, and its ‘Ombudsman’ function (rather than its compliance element) is a potential model for an independent ‘Mining Ombudsman’ within the Papua New Guinea government system.

Although the primary model for grievance mechanisms should ideally sit outside the corporate orbit, there is increasing pressure on corporations to ensure they have their own internal processes for handling community complaints. Corporations broadly accept the UN Guiding Principles on Business and Human Rights as international reference to the operationalization of grievance mechanisms. The Principles’ Effectiveness Criteria for non-judicial grievance states that corporate operational level grievance mechanisms should possess six key principles; legitimate, accessible, predictable, equitable, transparent, and rights-compatible. In addition, operational level grievance mechanisms should be a source of continuous learning and engagement and dialogue.

Rio Tinto’s Communities Standard, is one example, and requires all its operations to put in place procedures for community complaints, disputes and grievances. The Centre for Social Responsibility in Mining (CSRSM) (Kemp and Gotzmann 2009) evaluated Rio Tinto’s feedback procedure against international best practices:

1. Legitimacy (The procedure has a clear governance and administrative framework with well-defined guidelines for staff roles, responsibilities and lines of reporting.)
2. Accessible (The feedback system is accessible to all community members.)
3. Equitable (Taking all feedback seriously regardless of who made it and making it available to all community members.)
4. Predictable (Process is clearly stipulated and predictable with the provision that complaints not addressed in a timely manner will be escalated through to higher management.)
5. Transparent (Extensive internal reporting provisions, including noting community feedback as an agenda on monitoring meetings, and new and on-going cases are discussed once a week. Serious cases are reported to higher management immediately.)
6. Rights-compatible (Commitment to international human rights standards.)
7. Continuous leaning (Procedures reviewed and amended as a result of opportunities for improvement that particular incidents may raise.)
8. Engagement and Dialogue (The process includes provisions for engagement and dialogue, including complainants’ expectations and suggestions and whenever possible incidents are resolved directly with the community member. Numerous complaints about the same issue may lead to the formation of a working group that involves representatives from communities and direct engagement and dialogue.)

Sources: CAO (<http://www.cao-ombudsman.org/about/whoweare/index.html>); Kemp and Gotzmann (2009)

## Principle:

There is a need to ensure that there are appropriate and accessible independent grievance mechanisms available – they should be pre-emptive, and be available throughout the life of the extractive operation.

## Policy Options:

1. Consider the establishment of a ‘Mining Ombudsman’ as an independent office that could ideally draw on international experience, and perhaps even personnel, to mediate disputes and, as with the CAO Ombudsman, ‘problem-solve’ conflicts that arise in the extractives sector. Ideally the office would be staffed by people with industry knowledge and a background in human rights.
2. Improve mechanisms for handling disputes internal to the community, with a particular focus on building the capacity of local customary processes. Reduce the need to make the formal law and justice sector the first resort for these.

## REDUCING SOCIAL AND ENVIRONMENTAL COSTS

The negative social and environmental effects of natural resources exploitation are well documented in Papua New Guinea (see Chapters 5 and 6), across the Pacific (see Banks 2013) and internationally. Mitigating or eliminating these effects reduces the risk of conflict and promotes more inclusive forms of growth. Approaches to this require both State and private sector extractive companies to work effectively to mitigate, as far as possible, the social and environmental impacts experienced. For the State, as noted above, a priority is to resource and build the capacity of the regulatory bodies so as to ensure that adequate standards, (developed with and agreed by communities, and perhaps internationally benchmarked as part of a review of the Environment Act), are set in mine development agreements and adhered to by the companies involved.

For the private sector, there are a range of standards and tools developed by international institutions (such as the IFC's Performance Standards) and industry bodies (such as the International Council on Metals and Minerals (ICMM)) that provide guidance on appropriate local practices, processes and standards, around impacts, rights and promoting development. The ICMM Mining: Partnerships for Development toolkit, for example, published in June 2011, includes a detailed guide for identifying and building partnerships between stakeholders. This framework for understanding and communicating the broader economic and social impacts of mining – at the national and local levels – aims to strengthen the debate and identify opportunities for partnerships to address the economic and institutional capacity gaps faced by so many mineral-dependent countries. Other guides, such as the ICMM Mining for Development toolkit (Franks et al 2013), provide pointers for best practice tools so as to enhance the links between mining and development outcomes.

The International Finance Corporation (IFC) has developed Performance Standards for environmental and social safeguards for large-scale extractive industry operators. These have been adopted by project financing banks using the Equator Principles, and now cover some three-quarters of global project finance. At the local level, the IFC performance standards (recently reviewed and overhauled) are regarded as the leading project-level social and environmental standards within the extractives sector. They have been adopted by the PNG-LNG project, for example. Project-induced in-migration, as noted in Chapter 5, presents a particular

challenge: migrants are lured by the economic opportunities that the operations provide, and this can place stress on public services that under-resourced local governments struggle to cope with. IFC guidelines on this (IFC 2009) provide a useful tool for seeking to mitigate and manage these effects (and have been trialled in at least one site in Papua New Guinea). It is important, though, that such standards are adapted to the Papua New Guinea setting, as in the Mineral Policy and Mining Act reviews carried out from 2013/ 2014.

One of the key challenges identified in Chapter 6 for the sector are the environmental problems that large-scale resource operations can cause. There is clearly a need to insist on best practice and to be aware of international leads on environmental management, such as the international standards for riverine disposal, submarine tailings disposal and sea-bed mining.

While it is possible to mount arguments that position the nature of the receiving environment as the critical aspect in terms of environmental impact, hence allowing local conditions to influence environmental impact and management more than global standards, a key way to diffuse much of the environmental concerns and anxiety of communities and civil society will be ability to develop a credible, effective and independent capacity to assess EIS and monitor these effectively. The establishment of Conservation and Environmental Protection Authority (CEPA) offers the potential to bring about significant improvements in the capacity to assess and monitor the environmental performance of the sector, if it is sufficiently resourced and given the necessary authority.

The biodiversity offsets approach discussed in Chapter 6 provides another possible environmental avenue for the sector and the State to explore, especially given the largely localized (or linear) nature of the impacts of these operations. Taking this a step further, the Yasuni Ishpingo Tambococha Tiputini Trust Fund (Yasuni-ITT) model from Ecuador (Box 7.6 below) offers an alternative way of conceptualizing the value of Papua New Guinea's natural resources. A similar argument could be mounted regarding future large-scale mining (and to a lesser extent oil and gas) developments, in that international community concerns about the effects of these developments on the biodiversity and natural ecosystems of Papua New Guinea could be used to leverage funding from the international community for a commitment not to proceed with the development.

## BOX 7.6: CASE STUDY - THE YASUNI-ITT

The Yasuni Ishpingo Tambococha Tiputini Trust Fund (Yasuni-ITT Trust Fund) was established for receipt of contributions from supporters of Ecuador's decision to permanently forgo the extraction of oil from the Yasuni ITT fields (about 846million barrels). The contributions received were to be used to finance renewable energy and sustainable development investments such as avoidance of deforestation and conservation of ecosystems.

Through this unique initiative, Ecuador sought to address the challenges of climate change and sustainable development and gradually change its energy matrix from fossil fuel to renewable energy sources. The Yasuni initiative would have avoided the emission of an estimated 407million metric tonnes of Carbon Dioxide (CO<sub>2</sub>) by forgoing extraction and burning of fossil fuels, thus protecting one of the most bio-diverse regions of the world and maintaining the livelihoods of the area's indigenous people. In addition, it would have led to reforestation, that it was to promote nationally, as well as savings of 800million metric tonnes of CO<sub>2</sub> from avoided deforestation.

In the spirit of co-responsibility, Ecuador requested the world community to contribute 50 per cent of the income it is forgoing by not extracting the oil, amounting to US\$3.6billion (over a 13 year period), with the balance being the contribution of the people of Ecuador to the global good. The Yasuni-ITT Trust Fund was administered by the Multi-Partner Trust Fund Office (MPTF Office) of the United Nations Development Programme (UNDP).

In August 2013, after attracting commitments of millions, rather the billions being sought, the Ecuadorian government chose to end the scheme, and the funds were reimbursed or redirected into other sustainable development projects in Ecuador.

Source: UNDP

### Principle:

Regulation and policy should seek to reduce or mitigate social and environmental costs, and to capitalise on the opportunities to maximise benefits available to communities.

Environment protection can be difficult in the face of large-scale mining: but innovative policy solutions can assist.

### Policy Options:

1. Review social and environmental impact assessment and monitoring guidelines against international best practice – especially IFC and the International Association of Impact Assessment (IAIA) – along with practices in other comparable countries (as part of the Mining Act review). Should include all aspects, including exploration, impact assessment, involuntary resettlement, management of inward migration, operational environmental management and closure planning.
2. Follow through on the Constitutional and Law Reform Commission review of tailings management, looking particularly at the intersection of international best practice with local environmental conditions and community expectations.
3. Examine the potential costs and benefits of employing a biodiversity offset programme for all large-scale extractive operations.
4. At a more strategic level, develop a wider informed debate of the costs and benefits of a more staged approach to the development of the country's mineral resources. While a Yasuni ITT-like model may not be an option, the reservation of some reserves for potential exploitation later may hold benefits in terms of developing more effective government capacity and systems so as to gain the most from the extractive resources for sustainable human development.

## 7.5 POLICY ARENA 3: PRUDENT REVENUE COLLECTION AND MANAGEMENT

### APPROPRIATE FISCAL AND MONETARY REGIME

A range of tools have been developed at the international level to assist resource-rich countries to better manage their natural resources so as to maximize the long-term, broad-based benefits of these resources. Papua New Guinea has played a part with such initiatives (including the Mineral Resources Stabilisation Fund (MRSF) and Tax Credit Scheme discussed in Chapter 4), and is currently developing a SWF and in the process of becoming EITI compliant.

In terms of macroeconomic policies, there are three components that have been put forward as ways to avoid the most destructive economic effects of the 'resource curse'. These revolve around sound and robust fiscal management, an emphasis on diversification within the economy (dealt with below), and the importance of saving a portion of the revenues for future generations through, for example, a well-managed Sovereign Wealth Fund (SWF).

The first of these – fiscal management – involves managing the effects of a resources boom on the local currency. A booming extractives sector will likely put upward pressure on the currency, and this requires careful management to ensure that it does not detract from the international competitiveness of other sectors (particularly manufacturing and agriculture). Hence Hailu and Weeks (2012:2) argue that:

*'The major tasks of macroeconomic policy in the short term are preventive: preventing excessive overheating of the economy, preventing appreciation of the exchange rate, and preventing relative price changes that would make the short term a precursor of the medium term with declining tradeable sectors.'*

Other adverse effects can have similar consequences and need to be actively monitored and addressed by government. These can include upward pressure on inflation, wages and costs for

*"As part of alleviating poverty in PNG, our government should set aside resources for the upcoming generations or reserving our natural resources"*

JEREMIAH, 18 YEARS OLD

local producers as a result of a booming resources sector. These higher costs in turn can undermine the competitiveness of other parts of the economy (especially export-focussed sectors) that are more significant employers than the extractive industries, including manufacturing and agriculture. Higher wages available in the resources sector can also draw professional, skilled and semi-skilled labour out of other sectors of the economy, including the public service (as has happened anecdotally in Papua New Guinea). Often a lack of effective public financial management capacity or political exuberance in the face of a resources boom can contribute to a slip into excessive spending and poor application and accountability of the resource wealth, fuelled by public expectations of heightened government spending. All of these factors need to be accounted for in the design of appropriate government fiscal policy, with a focus on fiscal restraint (see Box 7.7).

By most assessments, while there may be scope to refine some elements of the Papua New Guinea fiscal regime, this is not likely to be significant in terms of better translating the economic gains to the State into improvements in sustainable human development. It is likely to work against the stability of the regime that over the past decade has been important in building investor confidence. What is clear, though, is that the fiscal restraint that international experience calls for has not been present in terms of government budgeting from 2012 (see Chapter 4).

## BOX 7.7: PRINCIPLES OF FISCAL PLANNING IN RESOURCE RICH NATIONS

In terms of fiscal policy, a recent IMF publication (Baunsgaard et al 2012) recommends that the fiscal policy framework for resource-rich developing economies:

- should reflect country-specific factors, which may change over time;
- should promote the sustainability of fiscal policy;
- should be sufficiently flexible to enable scaling up growth-enhancing expenditure, especially in low-income countries, when revenues from the extractives sector exceeds projected amounts;
- should consider absorption capacity constraints and the quality of public financial management systems in the design of forward fiscal planning;
- should provide adequate precautionary buffers in countries that are vulnerable to high volatility and uncertainty of resource revenue; and
- could be supported by resource funds if they are properly integrated with the budget and the fiscal policy anchor.

The proposed SWF is ideally designed to play two critical roles in terms of more effective management of resource revenues, the third of the major challenges noted above. The Stabilization Fund element of the SWF is designed specifically to reduce the effects of fluctuating extractive sector revenues, while the long-term Development Fund will seek to invest a portion of revenues so as to provide for a revenue stream well into the future. There are a number of models for SWF such as for Ghana (see Das et al 2010 and Box 7.8 below) and even a set of internationally agreed principles – the Santiago Principles. These emphasize the need for clear, stable and transparent investment and fiscal rule-

making around the distribution and drawdowns from the fund. They also stipulate independence from political interference in the management and regulatory oversight of the fund, and offshore holding (so as to reduce currency effects) of the investments (Revenue Watch Institute and Vale Columbia Centre 2014). In terms of the objective of translating resource wealth into sustainable human development, the use of funds from the SWF should be aimed primarily at supporting improvements in health delivery, education and infrastructure (as noted above), as well as at promoting diversification of the economic base of the country (as discussed below).

## BOX 7.8: CASE STUDY - GHANA'S SOVEREIGN WEALTH FUND

Financed by petroleum revenues and established in 2011 under the Petroleum Revenue Management Act (PRMA), Ghana currently has three natural resource funds with clear objectives established through legislation; the Petroleum Holding Fund established to collect, allocate and manage petroleum revenues in a responsible, transparent and accountable manner for the benefit of Ghanians, the Ghana Heritage Fund for saving revenues for the benefit of future generations, and the Ghana Stabilization Fund established to help mitigate budget volatility. Together, the Ghana Stabilization Fund and the Ghana Heritage Fund, also collectively known as Ghana Petroleum Funds (GPF), manage over US\$450million (2014).

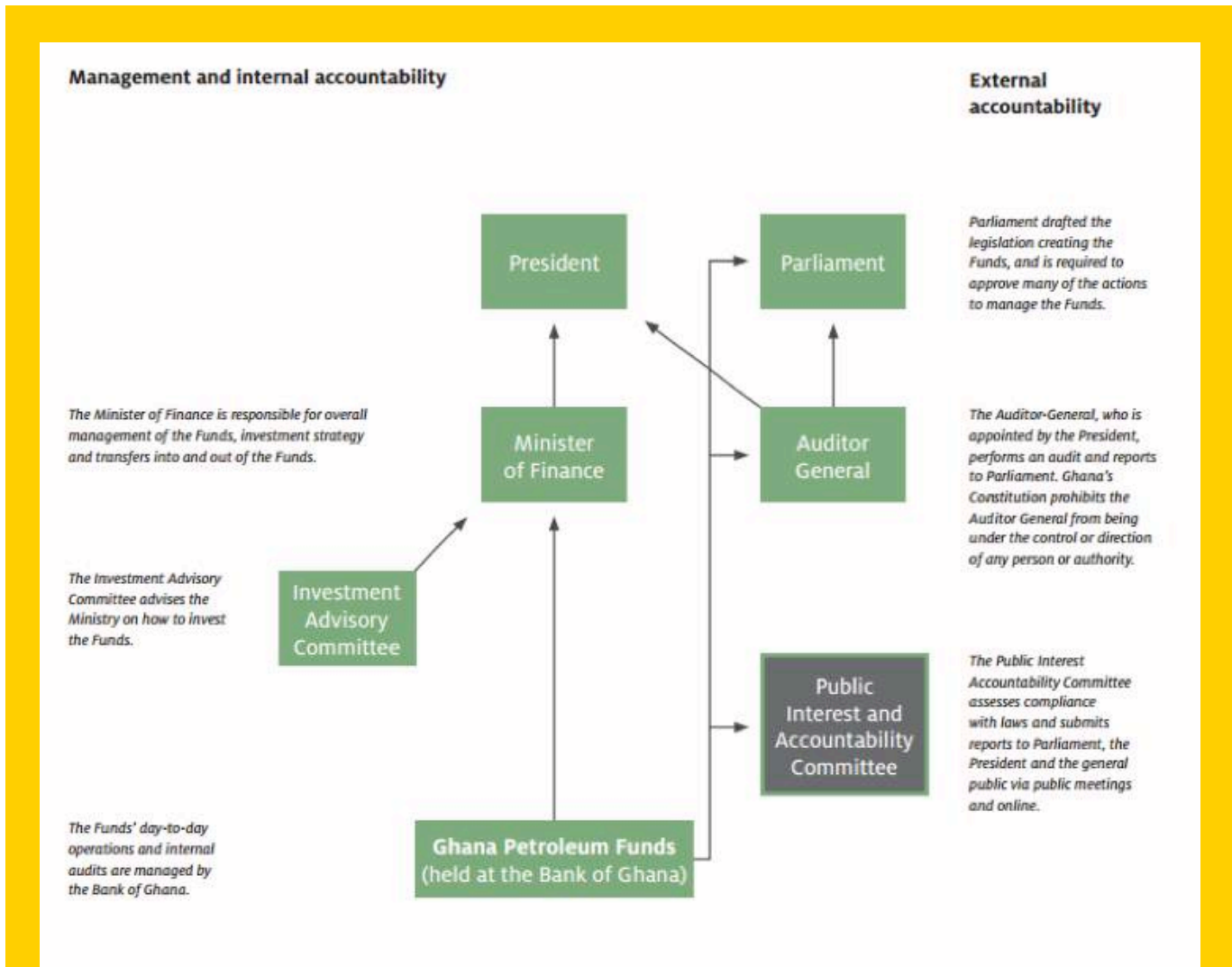
With respect to fiscal rules, the Ghanaian parliament has established clearly defined and appropriate fiscal rules, including conditions under which deposits and withdrawals can be made. Petroleum revenues, including royalties, profit oil, corporate income tax, participating interest, transfers from the Ghana National Petroleum, investment income and surface rentals are first deposited in the Petroleum Holding Fund at the Bank of Ghana, after which it is allocated to Ghana National Petroleum Corporation (GNPC), the Annual Funding Budget Amount (AFBA), and the GPFs. Deposits of up to 55 per cent of carried interest and 70 per cent of benchmark revenue are made to GNPC and the AFBA, respectively, after which a minimum of 30 per cent is made to the Ghana Heritage Fund and the remaining to the Ghana Stabilization Fund. Withdrawals from the Ghana Heritage can be made only once the oil reserves have depleted and both GPF assets are transferred to the Ghana Petroleum Wealth Fund. From this point, the amount allocated to the AFBA shall not exceed the interest earned by the Ghana Petroleum Wealth Fund. Withdrawals from the Ghana Stabilization Funds can be permitted if quarterly oil revenues fail to cover 25 per cent of the Annual Budget Funding Amount. To avoid undermining fiscal sterilization and circumventing transparency and accountability systems, GPFs are explicitly prohibited from direct domestic investment. The funds can be invested in debt instruments and with investment grade ratings. Following these rules, the funds have been invested at Euroclear Bank in AAA-rated low risk bonds.

The funds exist under an accountable system. While the Bank of Ghana manages the fund's day to day operations and internal audits, the Minister of Finance is responsible for the overall management, including investment strategy and reports directly to the President of Ghana.

The PRMA established the multistakeholder PIAC to oversee the funds. The PIAC consists of 13 members from civil society – including unions, traditional chiefs, journalists, lawyers, chartered accountants, and religious groups – who are appointed by the Minister of Finance for two to three year terms. The PIAC's mandate is to monitor and evaluate compliance with the PRMA, provide a platform for public debate on the use of petroleum revenues, and provide an independent assessment of the management and use of petroleum revenues. The PIAC released its first report in May 2012 highlighting revenue flows along with challenges. While the establishment of the PIAC is a positive step towards an independent overseeing committee, the PIAC's ability to incentivize the government to meet its objectives and to effectively contribute towards good governance remains a challenge.

To strengthen the fund's transparency and disclosure of external audits, the Government of Ghana has engaged Ernst & Young to conduct external audits.





Source: [http://www.resourcegovernance.org/sites/default/files/nrf\\_Ghana\\_Jan2013\\_RWI\\_VCC.pdf](http://www.resourcegovernance.org/sites/default/files/nrf_Ghana_Jan2013_RWI_VCC.pdf)

Source: UNDP

**Principle:**

- Economic policies (including Fiscal regime and Monetary Policy) should aim to maximise returns to the country from the industry, while maintaining an investment climate that does not deter further investment.
- Translation of resource wealth into human development requires particular forms of revenue management so as to protect against the distortions that such revenue can generate.

**Policy Options:**

1. The fiscal regime has been relatively stable, and appears internationally competitive and compatible. It should continue to be subject to periodic reviews by credible internal and external parties to ensure this continues to be the case.
2. International (and Papua New Guinea) experience strongly suggests the government should, to the extent it is politically able to, exhibit greater fiscal restraint than it has in recent years.
3. The need for management of resource revenue volatility would suggest a rule-bound stabilisation mechanism be incorporated into the design of the SWF.
4. Management of longer-term sustainability of resource revenues requires an independent, arms-length Sovereign Wealth Fund (SWF) that largely follows the Santiago Principles for the establishment and management of such funds.

## TRANSPARENCY OF AND ACCOUNTABILITY FOR REVENUE FLOWS

Transparency provides the basis for accountability, and for improved information to support decision-making, as well as providing confidence for communities and nations that resource revenue is effectively captured and used by the arms of government.

A key international mechanism for this is the Extractive Industries Transparency Initiative (EITI). In the current context, EITI and transparency that accompanies it is important in Papua New Guinea as it will make more obvious the extent and scale of revenue flows from the extractive sector (including many of the figures described in Chapter 4). This in itself is important as often the numbers discussed in the media and by political figures are misleading (one politician in 2011 spoke of 'trillions of kina' lost to the country from its resources, for example). And often there are significant variations between different official figures – in some years the figures regarding the tax take from mining and oil companies vary significantly between the Internal Revenue Commission (IRC) and BPNG, for example.

At the end of 2013 Papua New Guinea applied to join EITI, having developed a multi-stakeholder assurance group and sets of rules to guide the process. EITI is a coalition of governments, companies, civil society groups, investors and international organisations that seek to promote revenue transparency. It has developed a methodology for monitoring and reconciling company payments

and government revenues at the country level. Becoming fully EITI compliant however, will require commitment and clear resourcing from the Government.

There are also limits to EITI – it doesn't (at this stage) typically cover sub-national flows (see World Bank 2011c), and the transparency of flows between the extractive companies and the state (the central focus of EITI) is relatively robust already. It is also something of a high-profile but one-issue item as transparency is an important element that fits into broader concerns (as discussed above and in Chapter 4) about the management and use of resource revenues and the links to sustainable human development. One aspect of this is the building of 'knowledgeable consumers' of the information that EITI processes produce: understanding and awareness of the context and meaning of the figures around resource flows is required to make the process meaningful.

In the Papua New Guinea context, an important focus also needs to be the transparency of sub-national flows, something that EITI in its proposed form is not yet designed to address (although internationally this is also an increasing focus). The need to extend transparency into non-state flows – i.e. landowner and provincial government resource equity holding companies currently under the Mineral Resources Development Corporation (MRDC) – is equally important as there is a large amount of concern from landowners regarding the management of their own equity-holding companies.

### BOX 7.9: LIBERIA AND THE EFFECTS OF EITI

Post-conflict Liberia made tremendous efforts to promote transparency in the extractive industries. And the Extractive Industries Transparency Initiative (EITI) has been an essential part of such efforts. After launching its EITI process in 2006-2007, Liberia issued its first EITI reconciliation report in February 2009 covering the period June 2007-2008. Beyond covering three sectors (mining, forestry and agriculture) in its report, the country has included an audit on "What ought to be paid," as per the Liberia's EITI legislation, by extractive industry companies to the government. In 2009, Liberia obtained the EITI 'compliant' status making it the first country in Africa to do so. The increased climate of transparency, boosted by the introduction of Freedom of Information Act in 2009, improved the country's standing on the Transparency International's Corruption Perception Index (which has seen a dramatic jump from 137th to 75th position between 2005 and 2012). It has also successfully renegotiated several extractive industry contracts to obtain better deals.

Studies from San Tome and Principe also show that Civil Society Organisation (CSO) direction in the EITI process is not effective without adequate resource allocation to the CSOs involved. This participation is generally not costed and factored in, all of which can undermine effective CSO supervision. In countries with low human capital there is also a need for appropriate levels of training to prepare the CSOs for their role.

*Source: For more on Liberia's EITI, please visit <http://eiti.org/Liberia>: UNDP*

## Principle:

There should be mechanisms in place to provide transparency around resource revenue flows at all levels.

## Policy Options:

1. EITI process: carry through and achieve full compliance. For effectiveness may also require training and resourcing mechanisms for the multi-stakeholder group.
2. Look at extending principles and oversight mechanisms to sub-national levels, including a framework outlining revenue generation in and re-allocation to provinces and districts.
3. Extend transparency initiatives to state, provincial government and local landowner equity holding companies in the resources sector.
4. With transparency comes need for building understanding and awareness of what the information means for the wider population: awareness and capacity to interrogate the figures among civil society, the media and the broader population needs to be built.

## 7.6 POLICY ARENA 4: INVESTMENT IN HUMAN, PHYSICAL, FINANCIAL AND SOCIAL CAPITAL

### **SMART spending (equitable service delivery, social services and infrastructure)**

While there have been incremental improvements within parts of the Papua New Guinea public sector to promote more equitable service delivery and build social services and infrastructure so as to contribute to sustainable forms of human development, more can still be done. Increasing budget allocations to social sectors is necessary, but not sufficient. Spending needs to be 'SMART'

*“PNG is a naturally resourceful country in terms of gas, oil, gold etc...so that is why in the future I would like PNG to be from corruption so the budget allocated can be spent accordingly”*

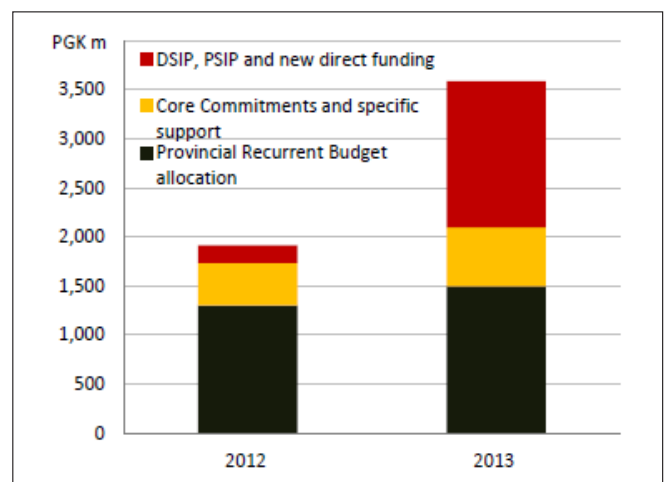
MELROSE SABUB, 19 YEARS OLD

(Specific, Measurable, Achievable, Relevant, Transparent or 'Time-bound') and adapt to the Papua New Guinea governance context. In line with the concept of results-based management (RBM), this approach can reinforce shifts within government towards better planning, budgeting, implementation, monitoring and evaluation mechanisms, and consequently strengthen the accountability of government to its citizens.

In terms of direct implications for sustainable human development, the policy shifts around free education and health are critical and the Government should be applauded for these significant

initiatives. At the same time, it is clear, as shown in Chapter 5, that there is a need for improved (SMART-er) implementation and delivery of these services.

Figure 7.2 Budget allocation, subnational level



Source: World Bank (2013)

In this sense, improving the delivery of services is clearly tied into broader improvements in governance and accountability, as discussed under 7.3.1 above, and particularly the need to better integrate and retain some form of strategic supervision over the increasing flows of public funds that are channelled through non-core line agency streams (PSIP, DSIP, LLSIP etc), (see Figure 7.2 illustrating the shift towards non-core line agency funding).

In this way strategic level government planning as expressed through the Vision 2050 and the National Strategy on Responsible and Sustainable Development – which clearly place sustainable human development at their core – can be better realized.

## BOX 7.10: BOTSWANA: TRANSLATING RESOURCE WEALTH INTO INCLUSIVE DEVELOPMENT

Botswana's minerals, mainly diamonds, form the largest component of the country's wealth, accounting for one-third of its GDP, half of government revenue and about 85 per cent of export revenues. Botswana's good governance systems and prudent fiscal policies have allowed the country to leverage its mineral wealth for human capital development. Using the Sustainable Budget Index (SBI) as an informal investment rule, most of Botswana's mineral revenues have been reinvested to enhance physical and human capital and play a significant role in the country's National Development Plans (NDPs).

Most of the revenue from investments is spent on social services, including infrastructure, health and education. Botswana has invested at least 4 per cent of its GDP annually on education and is leading Africa in terms of educational achievement. The adult literacy rate, for males and females, in Botswana is around 80 per cent, compared with 69 per cent and 50 per cent respectively in the rest of sub-Saharan Africa. At the time of independence in 1966, there were only 12km of paved roads – by 2007, Botswana had 7,000km of paved roads. Similarly per-capita income rose to US\$12,000 (purchasing power parity) compared to US\$70 at independence. By 1990, 90 per cent of its population had access to safe water, compared to 29 per cent in 1970. Botswana's increased productivity through investment in human and physical capital, together with its investment in foreign assets, will act to facilitate a 'soft landing' for life after minerals.

Sources: UNDP; <http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/Botswana-success.pdf>; <http://unesdoc.unesco.org/images/0021/002180/218004e.pdf>

### Principle:

Allocation of resource revenues by government should be directed towards those sectors that will maximize short, medium and long term returns in terms of human development (especially health, education and infrastructure).

### Policy Options:

1. Capitalise on existing free health and education policies (as well as on the additional nine development priority areas identified in the 2014 Service Improvement Program (SIP) guidelines, including infrastructure and community development) by focusing on improvements in local level delivery systems. Small incremental improvements to these will ensure lasting improvements in sustainable human development.
2. Adopt a strong, results-based management approach with a SMART spending framework that seeks to give effect to outputs expected under the strategic policy frameworks and Alotau Accords.
3. As part of this, ensure inclusion of corporate, civil society and donor initiatives into these processes, through an integrated 'development finance' approach that outlines domestic revenue generated along with external revenues, including Official Development Assistance (ODA) and aligns these revenues to national and sub-national development priority areas.

### INCLUSIVE EMPLOYMENT AND BROADER LIVELIHOOD CREATION

In many respects local employment is the contribution to human development that the extractive companies do best (and there is often a financial incentive to do so as it reduces expensive expatriate staff numbers). Mining (less so oil and gas) generates much-needed jobs, and provides incomes for people either directly or through employment with companies supplying goods and services to these companies. The question then becomes how best to leverage this for enhanced local, regional and national development, and particularly the growth of human capital. The case of Trinidad and Tobago (see Box 7.11), is an instructive example of how existing links between private sector and tertiary training institutions can be enhanced to deliver significant benefits

to the human resource base of the nation.

There are also significant opportunities to build new opportunities for enhanced livelihoods in communities affected by these large-scale operations. Livelihood restoration (as a result of involuntary resettlement) and improvements can be developed in a range of locally relevant ways. A number of companies (such as PJV at Porgera and PNG-LNG) have found working with women's groups has been a productive, demand-led way to deliver such programmes (see Chapters 4 and 5). A strategic and long-term approach to these programmes is needed, integrating with other aspects of the operation (fresh food supply, for example) and with government improvement programmes and activities. The focus needs to be on inclusivity, with a view to enhancing sustainable post-extractive human development.

## BOX 7.11: HUMAN RESOURCE DEVELOPMENT AND EXTRACTIVE INDUSTRIES – TRINIDAD AND TOBAGO

Trinidad and Tobago has been involved in the petroleum sector for over 100 years undertaking considerable oil and gas exploration activity on land and near-shore shallow water. As the largest oil and natural gas producer in the Caribbean, Trinidad and Tobago's hydrocarbon sector moved from an oil dominant to a mostly natural gas based sector in the early 1990s. Trinidad and Tobago houses one of the largest natural gas processing facilities in the Western Hemisphere. The Phoenix Park Gas Processors Limited (PPGPL) natural gas liquids (NGL) complex is located in the Port of Savonetta. It has a processing capacity of almost 2 billion cubic feet (Bcf) per day and an output capacity of 70,000 barrels per day (bbl/d) of NGL. After processing the gas is then transferred to the various power generators for generation of electricity and to the petrochemical plants for use as a feedstock.

The state-owned National Gas Company (NGC) has played a major role in the development of human capital through targeted training interventions and as a collaborator in the development of new sector specific training programmes. The Government's strategy for coping with the burgeoning demand for energy sector skills was to build on existing institutional capacity. Government established the Trinidad and Tobago Institute of Technology (2001) and the National Energy Skills Programme (NESC) as a specialist institution providing training for nationals wishing to enter the industry. These complimented existing capacity at the Metal Industries Company (MIC) and the University of the West Indies (UWI). In 2004, TTIT was converted into the University of Trinidad and Tobago (UTT), with an initial programme focus on engineering technology and entrepreneurship targeting the gas-based industries in particular.

NGC was directly involved in foundation work that led to the establishment of NESC and TTIT. The Company continues to execute a series of training initiatives and support special programmes to build national capacity for scarce skills through its traineeship and internship programs with the NESC, TTIT, UTT and MIC. NGC supports nationals pursuing programmes of study at these institutions by providing hands-on training for periods of one to two years. Many of the students have been afforded the opportunity of temporary, contract and permanent employment upon successful completion of their periods of training. Over the past 18 years, nationals have benefited from training in various disciplines such as accounting, electrical, telecommunications, air conditioning and refrigeration, offshore operations, mechanical engineering, instrumentation and pipeline maintenance and operations.

*Source: Asif Chida, MDG and private Sector Specialist, UNDP Pacific Centre*

### Principle:

Beyond the national level, the extractives sector can provide many economic opportunities for communities and individuals to improve their livelihoods and levels of human development, especially through employment.

### Policy Options:

1. Ensure that extractive industry developments explicitly address (through BSAs and Social Impact Assessments and Management Plans) how they will – in association with government – produce meaningful and sustainable improvements in livelihood options for local community members through local employment, livelihood restoration and local business development.

### DIVERSIFICATION OF ECONOMY

At the national level, diversification of the economic base is standard economic advice for beating the resource curse. It plays an important role in spreading the economic benefits from the extractives sector more broadly. It can do this both geographically (beyond the resource enclaves) and in terms of economic sectors, by supporting and promoting activities in other industries. Agriculture is the obvious sector in the Papua New Guinea context, but manufacturing (smaller scale, value-added niche manufacturing rather than large-scale) and tourism are other sectors that provide opportunities to spread the employment and income to other parts of the country.

A critical element of the economic policy framework is the need to invest returns from the extractives sector into infrastructure and activities that contribute towards a more diversified economic base. Diversification that reduces dependence on volatile commodity markets can provide for more stable and sustainable economic growth, and ensures that the natural capital being consumed by a resource-based form of growth is replaced by increasing levels of built, financial and human capital. Indonesia, Malaysia and Chile are examples of countries that in recent decades have managed to do this (see Box 7.12 below).

One pathway for this to occur is to link the economic enclaves that extractives can often become more closely linked with economic

activities elsewhere in the economy. As noted in Chapters 2 and 4, the large-scale extractives sector is capital intensive and therefore requires relatively little direct employment. It does, though, require large quantities of consumable inputs ranging from fuel and tyres, specialised equipment such as valve heads and engineering works,

*“I want the future to be more advanced in modern technologies to make life more interesting so that we can explore more and make life easy for people”*

ELMA KARA, 18 YEARS OLD

as well as more common items including food, uniforms and boots. If this demand can be met by locally owned and operated companies, the total induced employment benefits from mining may be several times larger than benefits from direct employment (OPM 2011). While the standard local content clauses in the Papua New Guinea extractive industry agreements are progressive, there is further potential to unlock the social and economic

benefits that upstream and downstream linkages with the sector can create. The most effective way to achieve this objective is by building partnerships between the key stakeholders, including the extractive industry companies, local suppliers, donors and NGOs. The Government, working with companies (as well as potentially donors) could work to identify and address obstacles faced by local suppliers, and seek to help overcome these by, for example, providing funding and technical assistance or vocational education initiatives.

The fact that the extractives sector will remain a dominant part of Papua New Guinea’s economic environment for 40 years or more provides the opportunity to think and act aspirationally in relation to building potential linkages within the economy and society. Papua New Guinea could, for example, focus on becoming a regional centre of excellence and expertise in relation to Pacific LNG and sea-bed mining activities, through funding (with industry support) high quality research and development facilities. Such opportunities for investment in research and development need not be restricted to the extractives sector, but could also rebuild and extend the research and extension capacity of national agricultural research institutes with a view to contributing to improvements in human development through enhancing productivity in the sector.

## BOX 7.12: DIVERSIFICATION AND WHY IT MATTERS – CHILE

Why should a country attempt to move away from a sector where it has a very strong comparative advantage? The simple answer is that diversifying an economy helps achieve growth in the long run and it reduces vulnerability to internal and external shocks. There are a number of channels through which export diversification can help. By increasing the number of export products, horizontal export diversification can reduce the dependence on a limited number of commodities that are subject to severe price fluctuations. Shifting away from enclave-type extractive industries can promote employment growth across the whole economy. The experience of Botswana, Chile, Costa Rica, and United Arab Emirates reveal that a virtuous path beyond resource dependence is a real possibility for Papua New Guinea.

Chile has been traditionally dependent on copper exports and thus vulnerable to frequent external price shocks. The country invested time and resources to reduce this dependency starting in the nineties. The number of markets that non-copper exports reach increased gradually from 111 in 1990 to an average of 148 after 1998. Similarly, product diversification (i.e. increasing number of product-categories being exported) occurred in almost all of Chile’s significant trade partners. Successful sectors include agricultural products such as wine, fruit, salmon and processed fish. ProChile estimates the country in 2012 was one of the top three world producers in 23 non-copper related products, compared to 11 products in 2003.

How did the country support export diversification? Chile’s production development agency, the Corporación de Fomento de la Producción (CORFO), employed a globally-recognized matching fund, demand-driven approach to Small and Medium Enterprise (SME) support. The programmes were delivered through partnerships with sector chambers and other bodies throughout the country. For example, the Exporters Association has been delivering CORFO-funded assistance to agribusinesses and SMEs for more than 5 years. Since the late 1990s, CORFO’s programmes have focused on better supply chain integration, regional development and clusters, with the twin aims of improving links between small and large enterprises and accelerating modernization and innovation in line with international market requirements.

Initiatives of CORFO and the Agriculture Ministry have been key to the widespread adoption by farmers of technically advanced irrigation systems and Good Agricultural Practices. These initiatives also fostered crop diversification and improved capacity to meet international standards. This led to Chile realizing export potential in areas previously not considered possible: i.e. dairy, sheep, cattle and poultry. One of the biggest gains has been in wine exports, with higher-quality, higher-profit bottles now outstripping by far bulk shipments. In the mid-1990s, it seemed as if Chile wine exports had reached a ceiling, at US\$500million. But by 2010, they had hit US\$1,500million and are expected to reach US\$3,000million by 2020. Diversification strategies have worked well, not only in production but also in markets, through combined use of trade negotiations and offshore promotion. Rural development gains have been notable.

Chile's commercial diplomacy has also been proactive in obtaining access to multiple markets at preferential tariffs. Chile signed over 20 free trade agreements, granting free access to markets such as the European Union, the United States, China and Japan. In the case of Chile, a coherent mix of trade liberalization and industrial and agricultural support policies enabled non-copper sectors to flourish.

Sources: *Trade and Human Development: A Practical Guide to Mainstreaming Trade* (UNDP, 2011), *Chilean Export Performance: The Role of Extensive and Intensive Margins* (Central Bank of Chile, 2011), *ProChile*

## Principle:

Policy efforts, supported by strategic government investments, should be directed at other sectors of the economy - to encourage and promote broad-based diversification of the economy to better support improvements in human development and create new opportunities for citizens in the longer-term.

## Policy Options:

1. Policy led and strategic investment of resource revenues (mediated through a SWF) could be directed towards other economic sectors (e.g. agriculture and tourism) that can form the basis for more inclusive and sustainable forms of growth.

## CORPORATE SOCIAL RESPONSIBILITY/CORPORATE COMMUNITY DEVELOPMENT (CCD)

Utilizing business skills and efficiencies as well as outreach capacity and corporate social responsibility (CSR) have proved in a number of settings around the world to be successful, particularly when accomplished through Public-Private Partnerships<sup>34</sup>. As noted in Chapter 5 in particular, companies in the extractives sector already contribute to a wide range of social and local economic initiatives.

There are a number of ways in which the contributions of these corporate community development (CCD) or CSR activities could be enhanced. One option adopted internationally is the requirement that companies direct a specified percentage of profits (or revenues) towards community development activities (see Box 7.13 below). In some senses the Tax Credit Scheme (TCS) (Chapters 4 and 5) already operates as a voluntary form of this, by allowing companies to spend up to 0.75 per cent of their gross revenues on approved infrastructure projects (although companies receive a tax credit for this spend). Any development of CSR requirements would require realignment of the fiscal regime and/or the TCS, and would need to allow for differing project economic models.

Industry-led health initiatives have also been successful in a number of locations (as discussed in Chapter 5) and could be developed further, building stronger links with the government

systems. Global evidence shows that adequate collaboration frameworks are critical for public-private partnerships in order for health care delivery to work. Clear incentive structures for all partners need to be supported by strong political commitment. There are also potential pitfalls in such an approach. A greater private sector presence in the delivery of health services in Papua New Guinea may result in improved efficiencies and quality, but it could also lead to more regional disparities between provinces with extractive industries and those without. Such increased disparities have been well documented in other resource rich countries where privatization of health services through the resource sector has aggravated an already unequal distribution of health resources (personnel and facilities). In those instances, competition has been amplified for already scarce personnel, further depleting the public sector and exacerbating the difference in the quality of the public and private services (Price 1988).

There is also considerable scope to tie more closely the private sector (and PNGSDP) general community development programmes into coordinated government planning processes at district, provincial and national levels. This could considerably enhance the sustainable human development returns on these programmes by ensuring their complementarity and integration with existing government priorities and service delivery activities.

<sup>34</sup> See in particular the work of the World Economic Forum: [http://www.weforum.org/pdf/Initiatives/gbs2006\\_report.pdf](http://www.weforum.org/pdf/Initiatives/gbs2006_report.pdf)

## BOX 7.13: CASE STUDY - LEGISLATING FOR CSR: INDIA

In August 2013, the Indian parliament passed the Indian Companies Act (2013), replacing the out of date Act of 1956. The Act has introduced a number of far-reaching changes affecting company formation, administration and governance, and has potentially increased shareholder control over board decisions. One of the new Act's most startling changes—which came into effect on April 1, 2014—has been to impose compulsory corporate social responsibility obligations on Indian companies and foreign companies operating in India. These obligations mainly come in the form of mandatory amounts companies must contribute to resolving social problems.

The threshold coverage levels for CSR are designed to exclude the bulk of the private sector, but target the larger corporate actors. Hence companies are subject to the CSR requirements if they have, for any financial year:

- a net worth of at least Rs.5billion (approx US\$80million);
- a turnover of at least Rs.10billion (approx US\$160million); or
- net profits of at least Rs.50million (approx US\$800,000).

Companies that meet these thresholds are required to develop a CSR policy and spend a minimum amount on CSR activities and report on these activities. An entity or business that meets these thresholds must spend no less than two per cent of its average net profit for the preceding three financial years on CSR activities.

There is a long list of areas towards which this commitment of CSR funding can be directed. They include such purposes as ending hunger and poverty; promoting public health; supporting education; addressing gender inequality; protecting the environment; and funding cultural initiatives and the arts.

All CSR funds must be spent in India. The Act encourages companies to spend their CSR funds in the areas where they operate. Money cannot be spent on activities undertaken that are part of the normal course of the company's business or on projects that exclusively benefit employees or their family members. The Act, though, has an exception allowing companies to use their CSR funds to support development projects initiated by the prime minister or central government.

The Act requires companies to appoint a Corporate Social Responsibility Committee consisting of at least three directors. The CSR committee is required to develop and recommend a formal CSR Policy. This document, which is to be submitted to the company's board, should recommend particular CSR activities, set forth a budget, describe how the company will implement the project, and establish a transparent means to monitor progress.

A company can meet its CSR obligations under the Act by channelling its activities through a third party, such as a society, trust, foundation or Section 8 company (i.e. a company with charitable purposes) that has an established record of at least three years in CSR-like activities. Companies may also collaborate and pool their resources, which could be especially useful for small- and medium-sized enterprises.

The Act does impose significant bureaucratic requirements on companies, as it requires the preparation of a detailed report to a template that outlines the company's CSR policy, the composition of the CSR committee, the amount CSR expenditures, and the specifics of individual CSR projects, not unlike the reporting requirements for donors and development partners. A company's board must include this in its annual report to shareholders and publish it on the company's website. The report must also include a statement from the CSR committee affirming that the implementation and monitoring of the board's CSR activities is, in letter and spirit, in compliance with its CSR objectives and CSR Policy of the company.

Source: Jones Day 2014: <http://www.jonesday.com/Indias-New-Corporate-Social-Responsibility-Requirements--Beware-of-the-Pitfalls-04-15-2014/>



## Principle:

Opportunities to direct and build on corporate efforts that support improvements in human development should be maximized, particularly through the integration and alignment of these efforts with local, provincial and national development plans and priorities

## Policy Options:

1. Consider legislating for a minimum spending commitment on community development activities from the large-scale extractives sector. This would require taking into account the re-balancing of other commitments, such as the fiscal regime and the TCS, and an assessment of whether the benefits would outweigh the likely significant compliance and monitoring costs.
2. Build mechanisms to better integrate these corporate community development activities more closely with national, provincial and local planning processes.

## DATA

One of the issues identified in the above chapters (and particularly in Chapter 5) is the limited nature and often-poor quality data that is available for decision and policy making in relation to the extractives sector. In large part this reflects a larger issue concerning the capacity and resources of state agencies to collect, analyse and deliver in a transparent manner, timely and accurate data to support development planning and delivery. The lack of quality data creates a gap that is easily filled by anecdote and misunderstandings.

At the National level, the formal EITI framework should improve and standardize data on the economic contribution of the sector and the individual operations. It will also illuminate at least some

of the sub-national flows (payments from the operations to local and provincial actors, for example).

At the local level, the absence of quality data on the effects on and contributions to sustainable human development is due in no small part to a lack of resources and focus for social monitoring programmes (which are typically mandated by DEC). Lihir, and more recently the PNG-LNG project, are exceptions and have set important precedents that should become regularized across the sector. Even in these programmes, though, there is scope for improvement, particularly in terms of integrating the links between these social monitoring programmes and local and district evaluation and planning processes. In other words, a strong applied, locally relevant focus can provide for greater integration between corporate and government service delivery and enhanced human development improvements (see Box 7.14).

## BOX 7.14: BEST PRACTICE PRINCIPLES FOR SOCIAL MONITORING IN PAPUA NEW GUINEA'S EXTRACTIVE SECTOR

**Community participation.** The programme must have significant community input into the design and implementation of the programme. The extent and nature of this 'significant' input may well vary depending on a range of factors, including the political status of the community, their interest in the process, and their ability to access external advice.

**Independence.** The social monitoring programme should not be carried out solely by the company, or solely by the community. Independence is widely regarded as a prerequisite for credible environmental and social monitoring of the industry.

**Transparency.** For the programme to be above suspicion, it should be transparent. One mechanism that assists in transparency is for the results of any monitoring to be publicly available.

**Beyond compliance.** The current regulatory regime is inadequate because it is inconsistent across the industry. It is inadequate because the limited resources of DEC do not allow them to effectively police the existing agreements.

**Coverage.** Social monitoring should provide a rigorous assessment of all the changes in, and effects on, the community. This assessment coverage should be agreed by all stakeholders, and typically requires collecting a wide variety of data, ranging from quantitative measures of economic and social change (compensation and royalty payments, business contracts, household economics and livelihoods, school enrolments, health trends, police arrest records, etc) to much more qualitative material on aspirations, opinions, concerns and problems. In geographic terms, the monitoring should take in all areas that the operation or its infrastructure has a significant and direct effect on.

**Programme life.** A programme must, as a minimum, continue from the start of the operation through to the end of its life, and probably beyond. It should ideally build on the Socio-Economic Impact Assessment – 'emerge seamlessly' from the SIA process – and a structure and agreed process for the monitoring should be in place by the time construction begins.

**Integration.** The programme should go beyond simply observing change and should be integrated with local and regional planning structures. A simple description of the changes occurring is a useful first step, but unless that information is integrated with, and used as the basis for, future planning (corporate and/or government) then there is little other than academic value in the work.

**Funding.** Ideally the programme should be jointly funded by government, community and company. This is primarily so as to provide the programme with a degree of ownership and credibility among all the key stakeholders.

*Source: Banks (1999b)*

One specific issue around data for sustainable human development is the potential to develop sub-national (provincial and or/district) measures of human development, such as a HDI. If accurate, regularly updated and integrated into planning processes, such measures can make a significant contribution to inclusive sustainable development efforts by ensuring that resources are targeted towards those areas in greatest need. As noted in Chapter 5, there is data on some indices of development that have been developed at these sub-national levels. However, they tend to be based on proxy measures and often, by necessity, use outdated data.

District level HDI indices can provide a very useful tool, but they are resource intensive and are really only worthwhile if they result in better policy, planning, and implementation. Given the lack of detailed 2011 Census material available during the development of this report (and concerns at the availability and accuracy of other sub-national data), it was not felt that the development of such a measure would be a productive exercise. An important area for future research would be the identification of a simpler local-level HDI process that is less resource intensive, is easily and accurately updated, and is accessible and useful for policy-makers and planners. Such a measure may also be of interest to extractive operations, as it would provide a tool with which their contribution to sustainable human development could be monitored.

and environmental aspects of the extractive industries can provide positive linkages and mutual reinforcement between economic growth and social and environmental stability and, ultimately, improvements in the levels of human development. This report has sought to present evidence-based policy options for enhancing the positive linkages between the various sectors and initiatives that are already being pursued, and proposing new policy options that seek to: (a) enhance opportunities for human development across the social, economic and environmental aspects of sustainable development; and (b) mitigate risks associated with trade-offs between these different elements.

**Papua New Guinea has tremendous potential and a unique opportunity to translate the resource-led boom of the next few years into significant improvements in human development that match the economic growth predicted.** To do so, though, there is an urgent need to broaden the scope of policy initiatives beyond the existing arenas into areas where the potential contribution to sustainable human development can be significantly enhanced for the population of the country now and in future. The policy options suggested in Chapter 7 will promote sustainable human development by increasing the quantum of capital (especially human capital) through the targeted investment of revenue generated from extractives. It will equitably increase the income of a people through diversification of the economy and the generation

<b>Principle:</b>	Accurate and timely data on the contribution of the extractives sector at local, provincial and national levels is essential for improved policy and decision-making for sustainable human development.
<b>Policy Options:</b>	<ol style="list-style-type: none"> <li>1. Give consideration to enhancing government capacity and resources to carry out or require the accurate and timely data collection on the local-level effects of the sector on social, economic and environmental aspects of human development. Such social monitoring programmes should be longitudinal and integrated into local and provincial planning processes so as to enhance the opportunities, and mitigate the challenges, to sustainable human development.</li> <li>2. Investigate the development of meaningful sub-national measures of human development, and the processes by which such a measure could be integrated into provincial and district level planning processes.</li> </ol>

## 7.7 CONCLUSION

This report has made the social and environmental case – often disregarded in some growth analyses – for examining the costs (actual and scenarios) as well as opportunities (e.g. green growth) that typically underpin extractive forms of growth. The recognition of the strong economic case for inclusive and sustainable growth has been highlighted in the above review of the extractive sector’s contribution to sustainable human development in Papua New Guinea. There are also different ways in which the social, economic

of productive employment, among other benefits. All this hinges on improved governance (by all parties) in general and in relation to the extractives sector in particular.

**Reports such as these are only as good as the actions they spark:** translating the findings and policy options into improvements in sustainable human development is now the challenge for all stakeholders – the Government, civil society, the citizens and the extractives sector in Papua New Guinea.

# REFERENCES

- Allen, B., Bourke, R. M. and Gibson, J. (2005), Poor rural places in Papua New Guinea. *Asia Pacific Viewpoint*, 46: 201–217.
- Allen, M. and Z. Hasnain (2010). Power, pork and patronage: Decentralisation and the politicisation of the development budget in Papua New Guinea. *Commonwealth Journal of Local Governance*, 6: July 2010. Available on-line at <http://epress.lib.uts.edu.au/ojs/index.php/cjlg/article/download/1617/1748>
- Allison, A. (2007). Introduction to the Fauna of Papua, in Marshall, A, J & Beehler, B, M (eds) Volume IV: The Ecology of Papua, Parts One and Two. Singapore, Periplus Edition-, pp 479 – 494.
- Asian Development Bank (ADB)(2005). Papua New Guinea Country Environmental Analysis: Mainstreaming Environmental Considerations in Economic and Development Planning Processes. Manila: ADB.
- ADB (2012). Key Indicators for Asia and the Pacific 2012: Papua New Guinea. Manila: ADB.
- ADB (2014). Asia Development Outlook 2014. Manila: ADB.
- Applied Geology Associates (AGA) (1989). Environmental, Socio-Economic and Public Health Review: Bougainville Copper Mine. Review for National Executive Council of Papua New Guinea. Wellington: Applied Geology Associates.
- Anitua (2014). Corporate Profile. Lihir: Anitua.
- AusAID (2006). Impacts of HIV/AIDS 2005–2025 in Papua New Guinea, Indonesia and East Timor. Canberra: AusAID.
- Auty, R. (1993). Sustaining Development in Mineral Economies: The Resource Curse Thesis. Routledge: London.
- Babon, A. and G.Y. Gowae (2013). The context of REDD+ in Papua New Guinea. Drivers, agents and institutions. Bogor, Indonesia: Center for International Forestry Research, Occasional Paper 89.
- Bainton, N. (2011). Customary Dispute Handling Processes at the Lihir Gold Mine, Papua New Guinea. Paper Presented at the Pacific Mining Conference, Noumea, November.
- Bainton, N. (in press). Migrants, labourers and landowners in the Papua New Guinea resource sector: A view from the Lihir gold mine, In Le Muer and Filer (eds.) Large-scale mining and local level politics in New Caledonia and Papua New Guinea. ANU Epress.
- Bainton, N. A., C. Ballard, K. Gillespie, N. Hall (2011). Stepping stones across the Lihir Islands: Developing: cultural heritage management strategies in the context of a gold-mining operation. *International Journal of Cultural Property*, 18: 81–110.
- Bainton, N. and M. Macintyre (2013). "My land, My work": Business development and large-scale mining in Papua New Guinea. Engaging with Capitalism: Cases from Oceania, *Research in Economic Anthropology*, (33), 137–163.
- Bank of Papua New Guinea (BPNG) (2012, 2013, 2014) Quarterly Economic Bulletin. Port Moresby: Bank of Papua New Guinea.
- Banks, G. (1999a). 'The economic impact of the mine' in C. Filer (ed.) *Dilemmas of Development: the Social and Economic Impact of the Porgera gold mine 1989-1994*. Canberra and Port Moresby: Asia-Pacific Press, (Pacific Policy Paper 34), Resource Management in Asia Pacific project, and National Research Institute (Special Publication 24) [pp. 88-127].
- Banks, G. (1999b). Keeping an eye on the beasts: social monitoring of large-scale mines in New Guinea. *Resource Management in Asia Pacific Working Paper No. 21*. Canberra: Research School of Pacific and Asian Studies, The Australia National University. 10pp. Also available on-line at [http://rspas.anu.edu.au/papers/rmap/Wpapers/rmap\\_wp21.pdf](http://rspas.anu.edu.au/papers/rmap/Wpapers/rmap_wp21.pdf)
- Banks, G. (2005). Globalization, poverty, and hyperdevelopment in Papua New Guinea's mining sector. *Focaal, European Journal of Anthropology*. 46: 128-143.
- Banks, G. (2007). 'Money Rain': indigenous engagement with business models in Papua New Guinea. *Development Bulletin*. 72: 36-39.
- Banks, G. (2013), Mining, in *The Pacific Islands: Environment and Society* (2nd ed.). (edited by Moshe Rappaport). Bess Press: Hawaii [pp1080-1123].
- Banks, G. and C. Ballard (eds) (1997) *The Ok Tedi Settlement: Issues, Outcomes and Implications*. Canberra: Resource Management in Asia-Pacific and National Centre for Development Studies (Pacific Policy Paper No.27). 279pp.
- Banks, G., D. Kuir-Ayius, D. Kombako, and B. Sagir (2013). Conceptualising mining impacts, livelihoods and corporate community development in Melanesia. *Community Development Journal*, 48(3): 484-500.
- Barrick Gold (2013). Responsible Mining: Responsibility Report 2013. Available on-line at <http://barrickresponsibility.com/media/1309/2013-full-report.pdf>
- Baunsgaard, T. et al. (2012). Fiscal Frameworks for Resource Rich Developing Countries. IMF Staff Discussion Note 12/04. IMF: Washington, D.C.. <http://www.imf.org/external/pubs/ft/sdn/2012/sdn1204.pdf>.
- Bauze, A.E., Tran L.N., Nguyen K-H, Firth S, Jimenez-Soto E, et al. (2012) Equity and Geography: The Case of Child Mortality in Papua New Guinea. *PLoS ONE* 7(5): e37861. Accessed online: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0037861>
- Baxter, M. (2001). Enclaves or Equity: The Rural Crisis and Development Choice in Papua New Guinea. Canberra: Australian Agency for International Development.
- Bebbington, A. (ed.) (2012). *Social Conflict, Economic Development and Extractive Industry: Evidence from South America*. Abingdon: Routledge, 2012.
- Behre Dolbear (2013). 2013 Ranking of Countries for mining investment or 'where not to invest'. Available on-line at <http://www.dolbear.com/announcements/2013-ranking-of-countries-for-mining-investment-or-where-not-to-invest>
- Bentley, K. (2011). Lihir Social Demographic Health Survey. Canberra: Centre for Environmental Health.
- Bonnell, S. (1999). Social Change in the Porgera Valley, in Filer, C. (ed.), *Dilemmas of Development: The Social and Economic Impact of the Porgera Gold Mine 1989-1994*. Canberra and Port Moresby: Asia Pacific Press and The National Research Institute, pp.19-87.
- Brewer, D., D. Milton, G. Fry, D. Dennis, D. Heales, W. Venables (2007). Impacts of gold mine waste disposal on deepwater fish in a pristine tropical marine system. *Marine Pollution Bulletin* 54: 309–321.
- Burton, J. (1999). Evidences of the new competencies. In Filer, C. (ed.) , *Dilemmas of Development: The Social and Economic Impact of the Porgera Gold Mine 1989-1994*. Canberra and Port Moresby: Asia Pacific Press and The National Research Institute, pp.280-301.
- Byford, J. (2001). One day rich: community perceptions of the impact of the Placer Dome gold mine, Misima Island, Papua New Guinea, Report commissioned by Oxfam/CAA.

- Callan, M. (2013). What do big miners contribute to Papua New Guinea's development? Development Policy Blog, 20 March 2013. <http://devpolicy.org/what-do-big-miners-contribute-to-papua-new-guineas-development-20130320-2/>
- Carmignani, F. and D. Avom (2010). The social development effects of primary commodity export dependence. *Ecological Economics*, 70: 317-330.
- Clark, H. (2012). Achieving Sustainable Human Development. Opening Speech at Fifth Ministerial Forum for Development. Brasilia, Brazil, Tuesday 29 May 2012
- Collier, P. and A. Hoeffler (2004). Greed and Grievance in Civil War. *Oxford Economic Papers*, 56, 563-595.
- Crispin, G. (2003). Environmental management in small scale mining in PNG. *Journal of Cleaner Production*, 11: 175-183
- Dadush, U. and B. Stancil (2010). The World Order in 2050. Policy Outlook, Carnegie Endowment for International Peace.
- Daniel, P., K. Palmer, A. Watson and R. Brown. 2000. Review of the Fiscal Regimes for Mining and Hydrocarbons. Port Moresby: Asian Development Bank for PNG Tax Review.
- Daniele, V. (2011). Natural Resources and the 'quality' of economic development. *The Journal of Development Studies*, 47(4):545-573.
- Datt, G. and T. Walker (2006). Does mining sector growth matter for poverty reduction in Papua New Guinea? *Pacific Economic Bulletin*. 21(1): 71- 83.
- Department of Health (2013). National Health Plan 2010-2020, Sector Performance Annual Review (SPAR) 2013. Port Moresby: Department of Health.
- Das, U., A. Mazarei and H. van der Hoorn (2010). Economics of Sovereign Wealth Funds: Issues for Policymakers. IMF: Washington, D.C.
- Diamond, J. (2012). *The world Until Yesterday*. Allen Lane Pub.
- Donigi, P. D. (1994). *Indigenous or Aboriginal Rights to Property: A Papua New Guinea Perspective*. Utrecht: International Books.
- Dowse GK. et al. (1994). Extraordinary prevalence of non-insulin-dependent diabetes, mellitus and bimodal plasma glucose, distribution in the Wanigela people of Papua New Guinea. *Medical Journal of Australia*. 20;160(12):767-74
- Emerson, C. and Kraal, D. (2014). Taxation Reform Options for the Petroleum, Gas and Mining Industries in Papua New Guinea: A Symposium Paper. National Research Institute: Available online at [http://www.nri.org.pg/research\\_divisions/economic\\_studies\\_division/economics\\_downloads/Taxation\\_symposium\\_ppt/petroleum\\_gas\\_mining\\_tax.pdf](http://www.nri.org.pg/research_divisions/economic_studies_division/economics_downloads/Taxation_symposium_ppt/petroleum_gas_mining_tax.pdf)
- Ernst and Young (2014) Global LNG: Will new demand and new supply mean new pricing? Available on-line at [http://www.ey.com/Publication/vwLUAssets/Global\\_LNG\\_New\\_pricing\\_ahead/\\$FILE/Global\\_LNG\\_New\\_pricing\\_ahead\\_DW0240.pdf](http://www.ey.com/Publication/vwLUAssets/Global_LNG_New_pricing_ahead/$FILE/Global_LNG_New_pricing_ahead_DW0240.pdf)
- ExxonMobil Limited (2014). End of Construction Data Sheet. ExxonMobil PNG.
- Filer, C. (1990). The Bougainville rebellion, the mining industry and the process of social disintegration in Papua New Guinea. *Canberra Anthropology*. 13 (1): 1-39.
- Filer, C. (2012). The Development Forum in Papua New Guinea: Evaluating outcomes for local communities. In Marcia Langton and Judy Longbottom (eds), *Community Futures, Legal Architecture: Foundations for Indigenous Peoples in the Global Mining Boom*. Abingdon: Routledge (pp147-161).
- Filer, C. et al (2009). Deforestation and forest degradation in Papua New Guinea. *Annals of Forestry Science*, 66: 813.
- Filer, C. et al (2012) The Social and Economic Impact on the Resource Sector Job Stream in Papua New Guinea. IM4DC Action Research Report. Report to IM4DC project and World Bank. Available on-line at <http://im4dc.org/wp-content/uploads/2014/09/The-social-and-economic-impact-on-the-resource-sector-job-stream-in-PNG-Completed-Report.pdf>
- Franks, D., Parra, C., Schleger, A. (2013). Approaches to understanding development outcomes from mining. International Council on Mining and Metals (ICMM): London, UK. <https://www.csr.mq.edu.au/publications/icmm-approaches-to-understanding-development-outcomes-from-mining>.
- Fulu, E., X. Warner, S. Miedema, R. Jewkes, T. Roselli and J. Lang (2013). Why Do Some Men Use Violence Against Women and How Can We Prevent It? Quantitative Findings from the United Nations Multi-country Study on Men and Violence in Asia and the Pacific. United Nations Partners For Protection.
- Garnaut, R. and R. Namaliu (2010). PNG Universities Review: Report to Prime Ministers Somare and Rudd.
- Gibson, J. (2013). Two decades of poverty in Papua New Guinea. Presentation at Crawford School, ANU, Canberra, 5 June 2013.
- Gilberthorpe, E. and G. Banks (2012). Development on Whose Terms?: CSR Discourse and social realities in Papua New Guinea's extractive industries sector. *Resources Policy*, 37(2): 185-193.
- Ginsberg, N. (1957). Natural resources and economic development. *Annals of the Association of American Geographers*, 47(3): 197-212.
- Global Fund (2014). GFATM letter to the CMM chair of Papua New Guinea dated 12 March 2014. <http://www.theglobalfund.org/en/fundingmodel/allocationprocess/>
- Golub, A. (2014). *Leviathans at the Gold Mine: Creating Indigenous and Corporate Actors in Papua New Guinea*. Durham: Duke University Press.
- Gonzalez, A. (2012) from Oracle Mining Corporation (2012).
- Government of Papua New Guinea (GoPNG) (2013). *The Future we Want: Post-2015 Development Agenda*. GoPNG: Port Moresby.
- Gramling, C. (2014). Seabed mining plan advances, worrying critics. *Science*, 344: 463.
- Hailu, D. and J. Weeks (2012) *Macroeconomic Policies for Resource-Rich Countries*. G-24 Policy Brief No. 71.
- Household Income and Expenditure Survey 2009/10 (2011). National Statistical Office: Port Moresby.
- Howes, S., A. A. Mako, A. Swan, G. Walton, T. Webster & C. Wiltshire (2014). *A Lost Decade? Service delivery and reforms in Papua New Guinea, 2002-2012*. Port Moresby and Canberra: NRI and Development Policy Centre, ANU.
- Human Rights Watch (HRW) (2011). *Gold's Costly Dividend: The Porgera Joint Venture*. HRW. [http://www.hrwnews.org/distribute/png\\_020111/download/HRW\\_PNG\\_Summary.pdf](http://www.hrwnews.org/distribute/png_020111/download/HRW_PNG_Summary.pdf)
- Intierra RMG (2013). Mining Finance Drops 56% in June Quarter. Available on-line at [www.intierraRMG.com](http://www.intierraRMG.com)
- International Energy Agency (IEA) (2012). *World Energy Outlook 2012*. Available on-line at <http://www.worldenergyoutlook.org/publications/weo-2012/>

- International Monetary Fund (IMF) (2013). Papua New Guinea. IMF Country Report No. 13/339.
- International Tropical Timber Organization (2012). Annual Review and Assessment of the World Timber Situation. ITTO.
- Jackson, R. (1982). *Ok Tedi: the pot of gold*. Port Moresby: Word Publishing.
- Java, B. (2011). Is sustainable development a faceless rhetoric? An assessment of educational sustainability at the Porgera Mine, Papua New Guinea. MPhil thesis, Massey University, Palmerston North, New Zealand.
- Jenkins, C. (2006). *Cultures and Contexts Matter, Understanding and Preventing HIV in the Pacific*. Asian Development Bank: Manila.
- Jenkins, C. and Passey, M. (1998). Sexually Transmitted Diseases in Asia Pacific. (pp231-254). Venereology Publishing Inc. Armidale, New South Wales, Australia.
- Johnson, Penny (2011). *Scoping Project: Social Impact of the Mining Project on Women in the Porgera area*. Port Moresby: PEAK.
- Johnson, Peter (2012). *Lode Shedding: A Case Study of the Benefits to the Landowners, the Provincial Government and the State from the Porgera Gold Mine*. NRI Discussion Paper 124. NRI: Port Moresby.
- Kefferputz, R. and S-A. Mildner (2012). From the West to the Rest: Changing patterns on global metals and mineral markets: A need for global dialogue on raw materials in a changing world. AICGS Policy Report, The John Hopkins University.
- Kelly, A. et al (2011). *Askim Na Save – People who sell sex and exchange sex in Port Moresby*. PNGIMR and UNSW: Sydney, Australia.
- Kemp, D., and N. Gotzmann, (2009). *Community Complaints and Grievance Mechanisms and the Australian Minerals Industry*. Centre for Social Responsibility in Mining, The University of Queensland. Discussion Paper. Brisbane.
- Kirsch, S. (1996). *Cleaning up Ok Tedi: Settlement Favors Yonggom People*. *Journal of the International Institute* 4(1): 7. Reproduced in *Cultural Survival* online: <http://www.cs.org/>
- Kirsch, S. (2014). *Mining Capitalism: The Relationship between Corporations and Their Critics*. University of California Press.
- Lees, S., Havini, M., Murdock, J., Vienings, T., & Namgyal, J. (2013). *Bougainville Peace Agreement: The Burnham I and II Dialogues (Sharing and Exploring Pacific Approaches to Dialogue: A Compendium of Case Studies from Pacific Islands Countries: Case Study 06)*. Suva, Fiji: UNDP.
- Macintyre, M. (2007). *Informed Consent and Mining Projects: A View from Papua New Guinea*. *Pacific Affairs*, 80(1): 49-64.
- Macdonald, C. (2014). *The Political Economy of Mineral Revenue Governance and Children's Rights in Papua New Guinea*. Report to UNICEF PNG.
- Maun, A. (1997). *The Impact of the Ok Tedi mine on the Yonggom people*. In Banks, G. and C. Ballard (eds). *The Ok Tedi Settlement: Issues, Outcomes and Implications*. Canberra: Resource Management in Asia-Pacific and National Centre for Development Studies (Pacific Policy Paper No.27).
- May, R. (2012). "Papua New Guinea: Issues of Internal and External Security," *Security Challenges* 8(4): 47-60.
- McKinsey Global Institute (2013). *Reverse the Curse: Maximizing the Potential of resource-driven economies*. McKinsey Global Institute. Available online at [http://www.mckinsey.com/insights/energy\\_resources\\_materials/reverse\\_the\\_curse\\_maximizing\\_the\\_potential\\_of\\_resource\\_driven\\_economies](http://www.mckinsey.com/insights/energy_resources_materials/reverse_the_curse_maximizing_the_potential_of_resource_driven_economies)
- Mehlum, H., K. Moene and R. Torvik (2006). *Institutions and the resource curse*. *Economic Journal*, 116, 1-20.
- Mek, B. (2011). *Artisanal Small-scale Alluvial Gold Mining in Papua New Guinea: Meriyaka Alluvial Gold Mining – A Case Study*. *Papua New Guinea Journal of Science Technology and Engineering*, 2(1). <http://pngjstech.files.wordpress.com/2011/05/artisanal-small-scale-alluvial-gold-mining-in-papua-new-guinea.pdf>
- Menzies, N. and G. Harley (2012). "We Want What the Ok Tedi Women Have!" *Guidance from Papua New Guinea on Women's Engagement in Mining Deals*. J4P Briefing Note 7(2).J4P, World Bank. <http://documents.worldbank.org/curated/en/2012/09/16755155/want-ok-tedi-women-guidance-papua-new-guinea-womens-engagement-mining-deals>
- Mitjà, O., R. Paru, B. Selve, I. Betuela, P. Siba, E. De Lazzari and Q. Bassat (2013). *Malaria epidemiology in Lihir Island, Papua New Guinea*. *Malaria Journal* 2013, 12:98
- Mittermeier, R. A. Robles-Gil, P., Mittermeier, C.G. (eds) (1997). *Megadiversity: Earth's Biologically Wealthiest Nations*, CEMEX/Agrupacia on Sierra Madre, Mexico City.
- Mudd, G. (2012). *Preliminary Review of the Environmental Impacts of the Hidden Valley Gold Mine, Papua New Guinea*. Prepared for the Mineral Policy Institute (MPI) March 2012.
- National Economic and Fiscal Commission (NEFC) (2013). *Government, Money Arteries & Services. The 2012 Provincial Expenditure Review with trend analysis from 2008 to 2012*. NEFC: Port Moresby.
- National Statistical Office (NSO), Papua New Guinea. (2014). *2011 National Census*. NSO. Port Moresby.
- Nelson, J. and K. Valikai (2014). *Building the foundations for a long-term development partnership: The construction phase of the PNG LNG Project*. Cambridge, MA: The CSR Initiative at the Harvard Kennedy School.
- Noble, C. (2013). *The Role of Pacific Women in Peacebuilding and the Implications for Programming: Experiences and Case Studies from CPAD*. Report to the UNDP Pacific Centre. <http://cameronnoble.yolasite.com/resources/Paper%20on%20WPS%20and%20CPAD%20draft%203.pdf>
- Nonggorr, J. (1993). *Resolving Conflicts in Customary Law and Western Law in Natural Resource Developments in Papua New Guinea*. *University of New South Wales Law Journal*, 16(2): 433
- North Fly Health Services Development Program (NFHSDP) (2013). *2011 Annual Report*. Tabubil: NFHSDP.
- Office of Climate Change and Development (OCCD) (2011). *PNG REDD+ readiness – status and funding needs*. Port Moresby: OCCD.
- OECD-DAC (2008). *Natural Resources and Pro-Poor Growth: The economics and politics*. DAC Guidelines and Reference Series. Available on-line at: <http://www.oecd.org/dataoecd/56/63/42341879.pdf>
- O'Faircheallaigh, C. (1984). *Mining and Development: Foreign-financed mines in Australia, Ireland, Papua New Guinea and Zambia*. Beckenham: Croom Helm.
- Oil Search Limited (2013). *Strategy On Track: 2012 Transparency and Sustainability Data Book*. Oil Search Limited.
- Ongwamuhana, K. and A. Regan (1991). *Ownership of Minerals and Petroleum in Papua New Guinea: The Genesis and Nature of the Legal Controversy*. *QUT Law Review*. 7: 109-125.Oracle Mining Corporation (2012). *Copper*. Available on-line at: <http://www.oracleminingcorp.com>

com/copper/

Oxfam (2012). The Community Good: Examining the Influence of the PNG LNG Project in the Hela Region of Papua New Guinea. Oxfam. <http://www.oxfam.org.nz/report/the-community-good-examining-the-influence-of-the-png-lng-project-in-the-hela-region-of-papua-new-guinea>

Oxford Policy Management (OPM) (2011). Blessing or Curse? The rise of mineral dependence among low and middle-income countries. OPM. Available on-line at [www.opml.co.uk](http://www.opml.co.uk).

Papua New Guinea Department of Treasury. (2012). 2013 National Budget. (December)

PNG Chamber of Mining and Petroleum (2014). Chamber e-newsletter. January/February 2014. Port Moresby.

Papua New Guinea Institute of Medical Research (PNGIMR) (2014). Progress Report: Partnership in Health Project, July 2013 – December 2013. PNGIMR.

Pintz, W. (1984). Ok Tedi: Evolution of a Third World Mining Project. London: Mining Journal Books.

Price, M. (1988). The consequences of health service privatisation for equality and equity in health care in South Africa. *Social Science and Medicine*, 27(7):703-16.

Pulford, et al (2012). Malaria case management in Papua New Guinea prior to the introduction of a revised treatment protocol. *Malaria Journal*, 11: 157.

PricewaterhouseCoopers (2013). Mine – a confidence crisis? Review of global trends in the mining industry—2013. Available online at <http://www.pwc.com.au/industry/energy-utilities-mining/publications/mine-a-confidence-crisis.htm>

Regan, A. (1998). Causes and course of the Bougainville conflict. *Journal of Pacific History*, 33(3): 269-285.

Reto, K. (2002). Possible mercury poisoning in alluvial gold miners in the Porgera Valley, Papua New Guinea. *Journal of Rural and Remote Environmental Health*, 1(1): 10-12.

Revenue Watch and Vale Columbia Centre (2014). Managing the public trust: How to make natural resource funds work for citizens. New York: RWI and Vale Columbia Centre.

Scottish Association of Marine Science (SAMS)(2010). Final Report: Independent Evaluation of Deep-Sea Mine Tailings Placement (DSTP) in PNG. SAMS.

Sachs, J.D. and A.M. Warner (2001). The curse of natural resources, *European Economic Review*, 45, 827-838.

Sekhran, N. and S. Miller (eds) (1995). Papua New Guinea Country Study on Biological Diversity. Waigani, Papua New Guinea: Dept. of Environment and Conservation.

Shearman P., Bryan J., Ash J., Hunnam P., Mackey B., and Lokes B., (2008). The state of the forests of Papua New Guinea: Mapping the extent and condition of forest cover and measuring the drivers of forest change in the period 1972–2002, University of Papua New Guinea, Port Moresby.

Stream Research (2013). Informe de balance Mundial de GNL (Global LNG outlook).

Susapu, B., and G. Crispin (2001). Country Study Report on Small Scale Mining In Papua New Guinea, Mining Minerals and Sustainable Development Report. MMSD: London.

Swales, S., A. Storey, I. Roderick, B. Figa, K. Bakowa, C. Tenakanai (1998). Biological monitoring of the impacts of the Ok Tedi copper

mine on fish populations in the Fly River system, Papua New Guinea. *Science of The Total Environment*, 214(1–3): 99–111

Thomason, J. and M. Hancock (2011). PNG mineral boom: Harnessing the extractive sector to deliver better health outcomes. Development Policy Centre, Discussion Paper No.2, Australian National University.

Thorp R., S. Battistelli, Y. Guichaoua, J.C. Orihuela and M. Paredes (eds) (2012). The Developmental Challenges of Mining and Oil: Lessons from Africa and Latin America. Basingstoke: Palgrave Macmillan.

Tilton, J., J. Millett and R. Ward. (1986). Mineral and Mining Policy in Papua New Guinea. Discussion Paper 24. Port Moresby: Institute of National Affairs.

Transparency International (2008). Promoting Revenue Transparency: 2008 Report on Revenue Transparency of Oil and Gas companies. Transparency International. Available on-line at: [http://www.transparency.org/whatwedo/publication/promoting\\_revenue\\_transparency\\_2008\\_report\\_on\\_revenue\\_transparency\\_of\\_oil\\_a](http://www.transparency.org/whatwedo/publication/promoting_revenue_transparency_2008_report_on_revenue_transparency_of_oil_a)

United Nations (2012). The Future We Want. UN Conference on Sustainable Development (Rio+20). Available on-line at <http://www.uncsd2012.org/content/documents/727The%20Future%20We%20Want%2019%20June%201230pm.pdf>

UNAIDS (2012). National Commitments and Policies Instrument (NCPI): Papua New Guinea. UNAIDS. <http://www.unaids.org/en/regionscountries/countries/papuanewguinea>.

United Nations Conference on Trade and Development (UNCTAD) (2012). The State of Commodity Dependence 2012. UNCTAD: Geneva.

United Nations Development Program (UNDP) and Government of Papua New Guinea (1999) Papua New Guinea Human Development Report 1998. Port Moresby: UNDP and GoPNG.

UNDP (2007). Bougainville Human Development Report 2007: Developing Education from Within: Communities as critical agents of change. UNDP: Port Moresby.

UNDP (2010). Human Development Report. UNDP: New York.

UNDP (2012). Strategy Paper: Extractive Industries and Sustainable Development. New York: UNDP.

UNDP (2013). The Future We Want: Voices from the people of Papua New Guinea. Post-2015 Development Agenda Country Consultations. UNDP: Port Moresby.

UNDP (2014). Explanatory note on the 2014 Human Development Report composite indices: Papua New Guinea. UNDP: New York. Available on-line at [http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/PNG.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/PNG.pdf)

UNDP Africa (2011). Managing Natural Resources for Human Development in Low-Income Countries. UNDP Regional Bureau for Africa, WP 2011-002.

UNICEF (2012) Annual Report for Papua New Guinea. Available on-line at [http://www.unicef.org/about/annualreport/files/Papua\\_New\\_Guinea\\_COAR\\_2012.pdf](http://www.unicef.org/about/annualreport/files/Papua_New_Guinea_COAR_2012.pdf)

US Energy Information Administration (USEIA) (2014). International Energy Outlook, Natural Gas. Available on-line at [http://www.eia.gov/forecasts/ieo/nat\\_gas.cfm](http://www.eia.gov/forecasts/ieo/nat_gas.cfm)

Vail, J. (2012). Lihir Demographic Survey, 2012 update. Lihir Gold Limited.

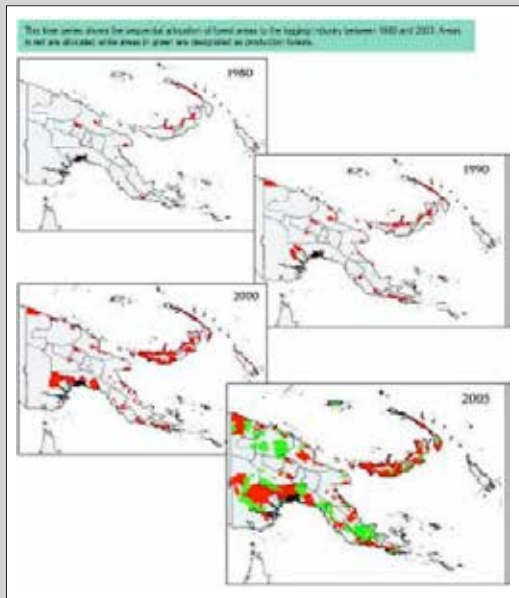
Vallely A. et al (2010). The prevalence of Sexually Transmitted Infections in Papua New Guinea: A systematic Review and Meta-Analysis. *PLoS ONE* December 2010. 5(12).

van der Ploeg, F. (2011). Natural resources: Curse or blessing? CESifo

- working paper Resources and Environment, No. 3125. Available on-line at <http://hdl.handle.net/10419/38934>
- West, R. (1992). Development forum and benefit package: a Papua New Guinea initiative. Port Moresby: Institute of National Affairs.
- Winkler, M. et al (2010). Assessing health impacts in complex eco-epidemiological settings in the humid tropics. *Environmental Impact Assessment Review*, 30(1): 52-61. <http://www.who.int/hia/examples/mining/whohia199/en/>
- Wiltshire, C. (2013). 'Reflections of the PNG Budget forum'. Development Policy Centre, available on-line at <http://devpolicy.org/reflections-on-the-png-budget-forum-can-devolved-funding-be-effectively-utilised-2013040/>
- World Bank (2009). Gender aspects of the extractive industries: Mining for Equity. Extractive Industries and Development Series #8. World Bank: Washington D.C.
- World Bank (2010). Managing Resource-Induced Volatility in Papua New Guinea: Some Issues for Discussion. The World Bank, East Asia and Pacific Region.
- World Bank (2011). PNG Health Workforce Crisis: A call to action. Port Moresby: World Bank.
- World Bank (2011b). Overview of State Ownership in the Global Minerals Industry: Long term trends and future. Raw Materials Group, World Bank. Available on-line at <http://siteresources.worldbank.org/INTOGMC/Resources/GlobalMiningIndustry-Overview.pdf>
- World Bank (2011c). Implementing EITI at the sub-national Level: Emerging Experience and Operational Framework. Raw Materials Group, World Bank.
- World Bank (2012a). World Development Report 2012: Gender Inequality and Development. Washington, D.C.: World Bank.
- World Bank (2012b). Papua New Guinea - Country gender assessment for the period 2011-2012. Washington D.C.: World Bank.
- World Bank (2013a). Papua New Guinea Economic Briefing: From the last days of the boom to lasting improvements in living standards. PNG Economic Brief. 2013-1. Port Moresby: World Bank. Available on-line at <http://www.worldbank.org/content/dam/Worldbank/document/EAP/Papua%20New%20Guinea/PNG-Economic-Brief-2013-1.pdf>
- World Commission on Environment and Development (1987). Our Common Future. New York and Oxford: United Nations and Oxford University Press.
- World Health Organization (2010). Cholera Country Profile: Papua New Guinea. Geneva: WHO. <http://www.who.int/cholera/countries/PapuaNewGuineaCountryProfile2010.pdf>
- World Health Organisation (WHO) (2011). Country Health Information Profile: Papua New Guinea. Geneva: WHO.
- WHO (2012). Official Development Assistance (ODA) for Health to Papua New Guinea. WHO. [http://www.who.int/gho/governance\\_aid\\_effectiveness/countries/png.pdf?ua=1](http://www.who.int/gho/governance_aid_effectiveness/countries/png.pdf?ua=1)
- WHO and National Department of Health (2012). Health Service

## APPENDIX 1. FORESTRY AND FISHERIES: DIFFERENT RESOURCES, SIMILAR CHALLENGES

### FORESTRY



The current forestry sector continues to be dominated by the export of round logs, with exports of over 3million cubic metres in 2012. These log exports were worth over K600million in 2012 (BPNG 2013). Papua New Guinea is the world's single largest source of round logs, and the bulk of these exports (around 80 per cent) are destined for China (ITTO 2012). Despite efforts in the past decade to shift to greater on-shore processing of the timber resource, this remains limited and focused on the domestic plywood market. The sector employs around 7,000 (PNG Forest Authority), and is dominated by four companies of Malaysian origin, including the largest, Rumbunan Hijau (RH).

In contrast to the extractive sector, where data on production is relatively easily obtainable, information on where the forestry occurs, who is involved and the extent of pressure on local, provincial and national resources is relatively limited. The most comprehensive recent report (Shearman et al 2009) does provide information on the extent of forestry operations at 2005 (Figure 8.1 Allocation of forest to logging, 1980-2005), the extent of

deforestation to date, and the likely remaining life of the potential forestry resource. The report made the claim that by 2021 Papua New Guinea's accessible commercial forest resource will be completely depleted, although this figure has been challenged (Filer et al 2009).

There is concern with illegal logging (by some estimates up to 70 per cent of production is not recorded - Greenpeace), although the extent of this problem is very hard to determine, and other commentators believe the actual figure is likely to be far lower.

There are also 62,000 hectares of plantation forestry in Papua New Guinea, largely in Momase and the Islands regions (PNG Forest Authority). The most common species were Eucalyptus and Acacia, and in 2006 the plantation forests (managed by the PNGFA) were valued at K123million.

### FISHERIES

Marine products exports were worth K330million in 2012. In addition, nearshore and inland fisheries contributed to both the domestic economy and to subsistence livelihoods in a range of different locations throughout the country. Tuna was the largest contributor: according to the PNG Fisheries Authority, in 2010 68,000t of tuna was exported, worth K320million<sup>35</sup>. Papua New Guinea occupies a significant place in global tuna supply, thanks in part to the abundant resource within its 2,437,480km<sup>2</sup> EEZ.

Currently the industry is dominated by foreign flagged vessels, manned by mostly non-Papua New Guineans, and only around 20 per cent of the tuna is currently processed in-country. Policy is directed at promoting the on-shore processing, which it is estimated could generate up to 50,000 jobs. The industry is managed through species specific management plans implemented by the PNG Fisheries Authority. A sophisticated vessel monitoring scheme, and participation in regional observer and illegal fishing initiatives seek to maximize the returns to the country from the industry. The Total Allowable Catch (TAC) regime currently used divides the estimated sustainable yield between fishers, with licenses being purchased for fishing efforts rather than actual catch. Each foreign vessel pays US\$5,500 per day of fishing effort up to a set maximum, and by managing fishing effort within the bounds of a TAC, the sustainability of the resource is thought to be preserved.

<sup>35</sup> The figures from the PNG Fisheries Authority are significantly higher than the official BPNG export values for 2010.



## APPENDIX 2. HDI TREND FOR PNG, 1980- 2013

Table 8.1 Papua New Guinea's HDI trends based on consistent time series data, new component indicators and new methodology

	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP\$)	HDI value
1980	52.8	4.1	1.2	1,705	0.323
1985	54.7	4.2	1.8	1,622	0.341
1990	55.6	4.7	2.3	1,616	0.363
1995	57.2	5.2	2.9	2,181	0.401
2000	58.7	6.4	3.2	1,898	0.423
2005	60.6	7.5	3.5	1,621	0.441
2010	62.0	8.6	3.9	2,112	0.479
2011	62.2	8.9	3.9	2,183	0.484
2012	62.3	8.9	3.9	2,404	0.490
2013	62.4	8.9	3.9	2,453	0.491

Source: [http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/PNG.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/PNG.pdf)

**APPENDIX 3: POPULATION AND POPULATION GROWTH RATES IN PAPUA NEW GUINEA BY PROVINCE, 1980-2011**



PROVINCE	CENSUS YEARS				ANNUAL GROWTH RATE			
	1980	1990	2000	2011	1980 to 1990	1980 to 2000	1980 to 2011	2000 to 2011
<b>PNG</b>	<b>3,010,727</b>	<b>3,761,954</b>	<b>5,190,786</b>	<b>7,254,442</b>	<b>2.2</b>	<b>2.7</b>	<b>2.9</b>	<b>3.1</b>
<b>SOUTHERN REGION</b>	<b>588,700</b>	<b>771,193</b>	<b>1,041,820</b>	<b>1,449,751</b>	<b>2.7</b>	<b>2.9</b>	<b>2.9</b>	<b>3.0</b>
Western Province	78,575	110,420	153,304	200,200	3.4	3.4	3.0	2.5
Gulf	64,120	68,737	106,898	157,525	0.7	2.6	2.9	3.6
Central	116,964	141,195	183,983	269,135	1.9	2.3	2.7	3.5
National Capital District	123,624	195,570	254,158	361,222	4.6	3.6	3.5	3.3
Milne Bay	127,975	158,780	210,412	275,932	2.2	2.5	2.5	2.5
Northern	77,442	96,491	133,065	185,737	2.2	2.7	2.8	3.1
<b>HIGHLANDS REGION</b>	<b>1,121,258</b>	<b>1,373,673</b>	<b>1,973,996</b>	<b>2,848,791</b>	<b>2.0</b>	<b>2.8</b>	<b>3.0</b>	<b>3.3</b>
Southern Highlands	236,052	317,437	360,318	509,488	3.0	2.1	2.5	3.2
Enga	164,534	235,561	295,031	431,418	3.6	2.9	3.1	3.5
Western Highlands	265,656	336,178	254,227	362,068	2.4	-0.2	1.0	3.2
Chimbu	178,290	183,849	259,703	375,604	0.3	1.9	2.4	3.4
Eastern Highlands	276,726	300,648	432,972	578,242	0.8	2.3	2.4	2.6
Hela	-	-	-	248,838				2.7
Jiwaka	-	-	-	343,133				5.6
<b>MOMASE REGION</b>	<b>857,773</b>	<b>1,027,600</b>	<b>1,433,432</b>	<b>1,862,633</b>	<b>1.8</b>	<b>2.6</b>	<b>2.5</b>	<b>2.4</b>
Morobe	310,622	380,117	539,404	673,448	2.0	2.8	2.5	2.0
Madang	211,069	253,195	365,106	492,162	1.8	2.8	2.8	2.7
East Sepik	221,890	254,371	343,181	449,395	1.4	2.2	2.3	2.5
West Sepik	114,192	139,917	185,741	247,628	2.0	2.4	2.5	2.6
<b>ISLANDS REGION</b>	<b>442,996</b>	<b>589,488</b>	<b>741,538</b>	<b>1,093,267</b>	<b>2.9</b>	<b>2.6</b>	<b>2.9</b>	<b>3.5</b>
Manus	26,036	32,840	43,387	60,307	2.3	2.6	2.7	3.0
New Ireland	66,028	86,999	118,350	193,488	2.8	2.9	3.5	4.5
East New Britain	133,197	185,459	220,133	327,355	3.3	2.5	2.9	3.6
West New Britain	88,941	130,190	184,508	263,338	3.8	3.7	3.5	3.3
Autonomous RB	128,794	154,000	175,160	248,779	1.8	1.5	2.1	3.2






## APPENDIX 4. COMPOSITE MDG INDICES (CMI) FOR PNG AND ITS PROVINCES BASED ON MDG INDICES

PROVINCE	COMBINATION OF INDICES RELATED TO MDG*							COMP. INDEX	RANK ORDER
	1@	1*	2	3	4/5	4	5		
Papua New Guinea	.771	.438	.613	.837	.600	.509	.478	.607	
<b>SOUTHERN REGION</b>									
Western	.702	.490	.762	.906	.520	.498	.498	.630	9
Gulf	.731	.320	.551	.765	.493	.167	.432	.489	18
Central	.792	.390	.772	.953	.578	.622	.418	.656	8
NCD	.372	.737	.840	.846	.810	.766	.822	.773	1
Milne Bay	.811	.260	.742	1.101	.668	.485	.572	.683	5
Northern	.780	.430	.675	.937	.448	.534	.468	.611	10
<b>HIGHLANDS REGION</b>									
Southern Highlands	.831	.530	.381	.419	.565	.545	.277	.478	19/20
Enga	.828	.610	.416	.495	.690	.448	.317	.514	17
Western Highlands	.805	.600	.520	.688	.598	.612	.399	.587	11
Chimbu	.836	.600	.529	.474	.708	.608	.407	.574	12
Eastern Highlands	.809	.500	.521	.600	.653	.574	.319	.554	15
<b>MOMASE (NORTHERN REGION)</b>									
Morobe	.741	.312	.629	.784	.590	.389	.503	.570	13
Madang	.756	.302	.612	.819	.538	.381	.463	.557	14
East Sepik	.756	.312	.634	.766	.558	.405	.410	.551	16
West Sepik	.769	.212	.604	.719	.485	.153	.415	.478	19/20
<b>NEW GUINEA ISLANDS REGION</b>									
Manus	.713	.562	.886	.948	.618	.684	.590	.727	2
New Ireland	.737	.492	.756	1.015	.640	.644	.623	.715	4
East New Britain	.789	.472	.820	.985	.633	.616	.655	.723	3
West New Britain	.785	.482	.724	.869	.538	.603	.578	.658	7
ARB	.770	.442	.769	1.011	.445	.702	.525	.676	6

Source: NPP draft 2013

## APPENDIX 5: PAPUA NEW GUINEA'S MDG 'SCORECARD' 2013.

 <p><b>OFF TRACK</b></p>	<p><b>TARGET 1.A</b></p>	<p>2 million people remain poor and/or face hardship. Key challenge to translate economic benefits from mineral wealth into broad-based improvements in living standards. Social challenges include low levels of education, poor housing and lack of access to clean water and proper sanitation. HIV/AIDS epidemic a major barrier. PNG likely to achieve its national target of 10 per cent reduction in people below the lower poverty line.</p>
	<p><b>TARGET 1.B</b></p>	<p>High employment rates due to large number in subsistence sector so high vulnerable employment. Formal employment increased since 2000, underpinned by LNG project. Very small proportion in wage employment. Urban unemployment rate high, especially among youths. HIV/AIDS epidemic affects productive capacity.</p>
	<p><b>TARGET 1.C</b></p>	<p>High prevalence of underweight children, concentrated in the Northern region, although very few children severely underweight. National target is to reduce the proportion of underweight births to total births to 9 per cent but recent data indicate no improvement.</p>
 <p><b>OFF TRACK</b></p>	<p><b>TARGET 2.A</b></p>	<p>Net enrolment rate up, but survival and literacy rates remain low. Against national targets – 85 per cent gross enrolment rate, 70 per cent cohort retention ratio and 70 per cent youth literacy ratio – PNG slightly lagging against access and more significantly against retention and youth literacy. Government abolished fees in 2010 to improve access. DOE cites 'in-school' (lack of educational infrastructure, absenteeism and financial barriers), and 'out-of-school' (lack of parental support, low value of education due to limited jobs, as well as law and order problems) hurdles. HIV/AIDS epidemic also adversely impacting education outcomes.</p>

 <p><b>OFF TRACK</b></p>	<p>● <b>TARGET 3.A</b></p>	<p>Gender parity in education improved since 1990 but far from equality. Women's employment in non-agricultural sector low, given large subsistence economy. Three women in parliament from one previously but still low representation. Before 2012 elections, Government introduced a Bill to allow 22 reserve seats, out of 109, but could not get Bill passed. PNG's could potentially achieve its national target to eliminate gender disparity at primary and lower secondary level by 2015 and at upper secondary level and above by 2030. Gender based violence widespread and key barrier.</p>
 <p><b>OFF TRACK</b></p>	<p>● <b>TARGET 4.A</b></p>	<p>Under-five and infant mortality increasing and relatively high. Low measles immunisation. Many infants and young children die from malaria, TB and HIV/AIDS. Delivery of basic health services, especially to rural areas, a dysfunctional health care system, and funding limitations are some key challenges. Also, lack of proper sanitation and safe water supply, as well as lack of funding for NGOs, mostly involved in health care at grassroots levels, are areas of concern. However, PNG will likely achieve its more modest national targets of an U5M rate of 72 and IMR of 44 by 2015.</p>
 <p><b>OFF TRACK</b></p>	<p>● <b>TARGET 5.A</b></p>	<p>MMR one of the highest in the Asia Pacific region, consistent with low level of skilled birth attendance. High level of fertility, high teenage pregnancy and low antenatal care coverage contributing factors. PNG's national target is to achieve a MMR of 274 by 2015, and based on trends, PNG is very unlikely to meet its national target.</p>
	<p>● <b>TARGET 5.B</b></p>	<p>Reproductive health care and family planning non-existent or not very effective in most parts of PNG, particularly in rural areas. Interventions remain ineffective, while contraceptives are not readily available for majority of women in PNG.</p>
 <p><b>OFF TRACK</b></p>	<p>● <b>TARGET 6.A</b></p>	<p>Gender inequality, particularly GBV, driving the HIV/AIDS epidemic. No sign that HIV/AIDS epidemic has stabilised. PNG is very unlikely to achieve its national target to have controlled by 2015 and stabilised the spread of HIV/AIDS by 2020.</p>
	<p>● <b>TARGET 6.B</b></p>	<p>PNG scaled up its national antiretroviral treatment programme since 2007 and improvements noted but concerns regarding coverage and availability of drugs remain.</p>
	<p>● <b>TARGET 6.CI</b></p>	<p>Malaria is leading cause of morbidity and mortality; highest disease burden. HIV/AIDS epidemic exacerbates the incidence of malaria. PNG very unlikely to meet its national target to have controlled by 2015 and stabilised the spread of malaria by 2020.</p>
 <p><b>OFF TRACK</b></p>	<p>● <b>TARGET 6.CII</b></p>	<p>Due to close association of HIV/AIDS with TB, TB death rates expected to increase. Low treatment success under DOTS.</p>
	<p>● <b>TARGET 7.A</b> ● <b>TARGET 7.B</b></p>	<p>Rigorous regulatory regime in place but enforcement major issue. Funding for maintaining PNG's wealth of biodiversity has declined substantially. Activities in the mining sector have adversely affected the environment, in some cases quite detrimentally. PNG's environmental track record is largely poor</p>
	<p>● <b>TARGET 7.C</b></p>	<p>Very large numbers do not have access to safe water. Majority of rural households use traditional pit toilets, while a significant number does not have any toilet facilities at all.</p>
	<p>● <b>TARGET 7.D</b></p>	<p>Squatter settlements increased in and around urban centres due to rural to urban drift. Squatter areas house most of the unemployed and under-employed, especially youths.</p>

## NATURAL RESOURCES AND THE CONSTITUTION

The fourth National Goal and Directive Principle specifically addresses the issue of natural resources: 4. Natural resources and environment.

We declare our fourth goal to be for Papua New Guinea's natural resources and environment to be conserved and used for the collective benefit of us all, and be replenished for the benefit of future generations.

WE ACCORDINGLY CALL FOR—

- 1) Wise use to be made of our natural resources and the environment in and on the land or seabed, in the sea, under the land, and in the air, in the interests of our development and in trust for future generations; and
- 2) The conservation and replenishment, for the benefit of ourselves and posterity, of the environment and its sacred, scenic, and historical qualities; and
- 3) All necessary steps to be taken to give adequate protection to our valued birds, animals, fish, insects, plants and trees.

## VISION 2050

In 2011 Vision 2050 was produced. This development vision for Papua New Guinea was developed through wide consultation with various civil society elements and sets out ambitious targets for the human development of Papua New Guinea. These include:

- Improve Papua New Guinea's Human Development Index (HDI) ranking to 50 from 148 amongst the United Nations member countries;
- Improve Papua New Guinea's access to services and basic infrastructure; and
- Improve life expectancy of Papua New Guineans from 57.9 to 77 years of age.

In terms of the economic sectors of the economy the Vision 2050 foresees a switch from reliance on extractive non-renewable natural resources to a more diverse economic base that underpins Papua New Guinea's future development. The Vision notes that:

"Currently, our economy is dominated by the mining and energy sectors. These sectors contribute approximately 80 per cent of our total export revenue.

The strategic direction for Vision 2050 is that, "Papua New Guinea will develop and grow the manufacturing, services, agriculture, forestry, fisheries and eco-tourism sectors from 2010 to 2050". This direction will enable economic growth by 2050 to be broad based, ensuring that disposable household incomes will be much higher than at present. These initiatives will enhance our socioeconomic performance and improve our overall HDI ranking.

The challenge therefore is, 'How do we shift an economy that is currently dominated by the mining and energy sectors, to one that is dominated by agriculture, forestry, fisheries, eco-tourism and manufacturing, between 2010 and 2050?'

## MEDIUM-TERM DEVELOPMENT PLAN 2011-2015

The Medium Term Development Plan 2011-2015 (MTDP) is a 5-year rolling development plan that seeks to provide a clear, accountable plan for investment so as to translate the Papua New Guinea Development Strategic Plan 2010-2030 (PNGDSP) into tangible results. It sets the sector strategies, targets, deliverables and their projected estimated cost of implementation. It also takes into account the lessons learnt and experience from the previous Medium Term Development Strategy 2005-2010 (MTDS). The MTDP outlines the specific players who will be responsible for achieving key deliverables and as such it strengthens the National Government's ability to monitor and evaluate investments over the coming years during the life of the PNGDSP 2010-2030.

In relation to human development, the MTDP states:

"The Government is committed to pursuing its human development policies through existing health and education initiatives. PNG has taken the challenge to reverse the regressing conditions of human development and will pursue its sectoral policies and strategies to achieve this and meet the ambitious targets of the PNGDSP. By intervening in the 'poverty hot-spots' of PNG, mostly in rural areas, the Government will be able to achieve the tailored MDG goals for 2015."

In relation to place and role of natural resources (Minerals as just one example):

### 4.5 Minerals

Goal: Double mineral exports, while minimising the adverse impacts on the environment

The minerals sector has been the key source of exports and revenue to the Government over the years. There remains considerable mining potential so the sector will continue to play a critical role in PNG's development.

**PHOTO CREDITS:**

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Page 2: UNDP PNG/2014

Pages 14, 16, 22, 53, 55, 82: G.Banks

Page 17: P.Bauman/Interpeace/2013

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