Resource Rent Extraction, Application, Consumption, Investment and Sustainability of Resource-Based Development in Resource-Rich Island Economies [1]

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1. Introduction

Historically, the development of mineral resources internationally has been widely regarded, with just cause in many cases, as an "enclave" activity, i.e., the activities and impacts of mining (hereinafter all individual mining, processing and/or smelting activities) were restricted to the immediate area of the mining activity and the benefits, primarily tax revenues of various types, accrued to the national government. Few if any benefits were derived by the populace living outside, and in some instances within, the "enclave" area.

Until the late 1980s and early 1900s the mining industry in Pacific Island Countries (PICs), with few exceptions, was able to act, often with the full support of government, as an "enclave" activity primarily on the basis of economic arguments e.g. as being the best way to ensure corporate profitability, foreign exchange earnings, tax revenues and for limiting "external" (environmental, social and cultural) costs. As a result, the majority of decisions relating to mining were almost always based on negotiations solely between industry and government and with a primary focus on economic "trade-offs" and/or concessions; very often to the detriment of the local areas most impacted by the mining activity. Within such a closed system, decisions often did not take into account, or only incompletely accommodated, the needs and views of other stakeholders, in particular, those of local communities, indigenous people, concerned Non-Governmental Organizations (NGOs), stockholders and a number of additional stakeholders with a diversity of vested interests. From the late 1980s, the number of concerned stakeholders, in particular the number who insisted on being involved with government and industry in mineral development negotiations, increased dramatically.

Especially important to the broadening of dialogue, joint actions and the inclusion of a number of concerned stakeholders during the late 1980s, and continuing through the 1990s, was the emergence of a number of entirely new issues that, to a greater or lesser degree depending on the individual PIC and the project, impacted on mining activities. Among the most important of these issues were/are global and/or regional environmental and commercial treaties; groups of inter-related factors, such as indigenous rights, sustainable development and inter-generational equity and, most directly impacting the industry, particularly in the PICs, were the actions of individual governments in response to the needs (demands) of their citizens. All of these issues must now be addressed by modern mining nations and the mining industry within the context of a "New Reality of Mineral Development" (Clark and Clark, 1999) that more fully incorporates the diversity of concerns and stakeholders associated with a modern mineral development. Specifically, this has led to the development and implementation of new approaches to mining-related development and to changes in governance, responsibility and to addressing the distributional effects of mineral sector development, in particular, through government decentralization and resource rent revenue sharing. All of these issues in turn have necessitated vastly changing roles for industry and government, at all levels, and the populace as a whole. Nowhere has this been more important than in the PICs because of their unique geography and cultures.

It is beyond the scope of the present paper to deal with the total spectrum of changes that are occurring within the mining sectors of the PICs in response to the abovementioned “New Reality", therefore, the present paper will focus specifically on two of the most complex issues facing PIC mineral development, i.e., the distributional effects of mineral sector development and sustainability. The present study begins with an overview of the nature of PICs in general and with respect to mineral development specifically and then focuses on the abovementioned two major issues that are central to the issue of the distributional effects of mineral sector development, i.e., resource rent revenue sharing and achieving sustainable development from mineral development.

2. The Nature of Pacific Island Countries

Before any discussion of the mining sector in PICs it is necessary to first make a number of observations concerning island nations that directly impact on issues or resource rent revenue sharing and sustainable development.

1. The PICs have a relatively small landmass size, as compared to the area of their associated Exclusive Economic Zones (EEZs). The emergent land mass of the Pacific Island Countries constitutes approximately 2% of the total territorial area claimed by these nations, i.e., 98% of the area of the Pacific Island Countries is marine (Table 1). Because of this relatively small landmass size, the associated financial, social and environmental impacts of mineral development has much larger importance, both nationally and locally, than in nations with larger landmasses.

Table 1. Pacific Island Country Land and EEZ Areas

Country, State or Island	Land Area (km^a)	EEZ Area[2] (km^2 x 1000)
American Samoa	197	427
Cook Islands[3]	240	1,830
Fed St. of Micronesia[3]	701	2,978
Fiji[4]	**18,272**	**1,290**
French Polynesia[4]	**3,265**	**5,030**
Guam (US)	541	207
Howland/Baker Is. (US)	<4	400*
Jarvis Is. (US)	<5	240
Johnston Atoll (US)	3	432
Kingman/Palmyra	132	300*
Kiribati[5]	690	3,550
Marshall Is. (Rep of)[3]	181	2,131
N. Marianas (Comm. Of)	477	1,823
Nauru[4]	**21**	**320**
Niue	259	390
Palau (Rep of)	496	629
Papua New Guinea[3,4]	**462,243**	**3,120**
Solomon Islands[4]	**27,556**	**1,340**
Tonga	699	700
Tuvalu	26	900
Vanuatu[5]	11,990	680
Western Samoa	2,933	120*

1. from various sources
2. * indicates an estimate
3. deep-seabed mineral resource potential
4. mineral-rich island nations
5. high potential for base and precious metal development.

2. The very nature of PICs dictates that they have extensive shorelines and, therefore, environmental impacts have not only an on-land component but also a substantial offshore effect. Additionally, for most PICs, many activities (near shore and offshore mineral developments) will be undertaken offshore. In both cases there will be a transfer of the environmental problem into the ocean environment where their effects may be broader and impact on other forms of resource development (fisheries).

3. Most PICs new mineral developments, as in other nations, often take place either in (a) in remote onshore and offshore areas where the economy, social structure and environment are virtually undisturbed and/or in and near densely populated urban centers where environmental these problems are already large. In the former case, economic, social and environmental impacts are highly visible, but initially, hopefully, less damaging, because of reduced pollution from newer facilities and a higher absorptive capacity for change in the areas or conversely. Conversely, in the latter areas the impacts may be less visible but are potentially more damaging as they are additive to an already stressed system.

4. The island nature of the PICs leads to difficulties in communication and management with respect to the management of diverse and separate mineral developments. In particular, their spatial distribution poses significant problems in monitoring and enforcing economic development, social and environmental policies, regulations and programs.

All of the above factors have added significance with respect to resource rent allocation and sustainable development because of the nature of mineral resources that dictates where, how and when they may be developed and utilized. Among the most significant are the following:

1. Worldwide, regionally or nationally mineral resources are not uniformly distributed in terms of either their quantity or quality. Therefore, mineral developments will be concentrated in some areas and absent within other areas; as will be the economic, social and environmental impacts of their development and exploitation.

2. Mineral resources have distinct and highly variable modes of occurrence that dictates how they will be developed and exploited. As examples, large deposits of coal, copper and phosphate are normally economically recoverable only by large-scale open-pit mining. Similarly, large deposits of potentially economic offshore mineral resources (manganese nodules, cobalt-rich manganese crusts and polymetallic sulfides) may require large-scale mining and production facilities. In both cases, the social and environmental consequences of development are large as are the economic benefits and the potential for sustainable development from the effective use of resource rents.

3. Past mineral discoveries and developments in the PICs normally means that the easiest to find deposits have already been discovered, therefore, present and future exploration is largely concentrated in "frontier areas." Areas that (a) require massive infrastructure development, and (b) within which large projects that require large social and environmental expenditures to prevent or mitigate social and environmental impacts, are the most likely to be developed.

3. Mining in the Pacific Island Countries

The PIC nations selected for study in the present paper include nations that are among the Asia-Pacific region's largest mineral producers (Papua New Guinea and New Caledonia); those that are smaller producers yet their mineral production is critical to the nations economic development (Fiji, Nauru, Solomon Islands) and those nations that have/may have a substantial onshore-offshore mineral potential that is yet to be developed (Cook Islands, Federated States of Micronesia, Samoa, and Vanuatu). In the following a brief description of the mineral sectors of the 5 mineral-rich PICs is given and the major producing mines and/or mines under active exploration or development are given in Table 2.

The Mining Sector of Fiji – The mining sector of Fiji is dominated by the production from a single mine, the Emperor Gold Mine (Vatukoula). Gold production at Vatukoula increased by 15% during the year, with 146,310 (119,256 in 1998/ 1999) ounces shipped from the mine, this included 1,279 ounces from tailings reclamation. 568,903 tonnes of ore, at a grade of 9.01g/ t were treated for the year. This was a significant improvement on the 509,242 tonnes of ore, at a grade of 8.77g/ t, that were treated in 1998/ 1999. In 1998/1999 gold production from Vatukoula contributed 7.4% of total exports and 2.7% of GDP. Recently (2000/2001) the mine has faced decreasing ore grades and has begun receiving subsidies from the government to remain operational.

The Mining Sector of Nauru – The tiny island country of Nauru was a major producer of high-grade phosphate from 1920-1968 with an annual production of approximately 700,00t/yr during that period. Reserves of phosphate rock were exhausted in 2000. Phosphates have given Nauruans one of the highest per capita incomes in the Third World (estimates of GDP varying widely). Substantial amounts of phosphate income are invested in trust funds to help cushion the transition. The government also has been borrowing heavily from the trusts to finance fiscal deficits.

The Mining Sector of New Caledonia– The mining sector of New Caledonia is dominated by the mining and processing of nickeliferous laterite-saprolite and garnerite ores. In 1999 New Caledonia was the world's fourth largest nickel producer after Russia, Canada and Australia (Kuck, P.H., 2000). Major smelting and refining to produce ferronickel of various grades and nickeliferous matte occurs at the Doniambo Smelter in the harbor of Noumea, the territorial capital, on Le Grande Terra Island. Nickel is the mainstay of the nation's economy accounting for about 12% of GDP and about 80% of all exports. Additionally, New Caledonia has approximately 25% of the world's known nickel reserves (Mining Journal, 1999).

The Mining Sector of Papua New Guinea – Papua New Guinea is by far the largest mineral producer within the PICs with 5 major operating mines (Table 2), two projects in advanced exploration/development (Ramu Nickel and Morobe). However, three of the largest mines in Papua New Guinea are now moving toward closure (Misima – 2005; Porgera – 2009 and Ok Tedi – 2010) and the country's largest mine (Panguna) on Bougainville Island was forced into early closure in 1989. According to the Department of Mining (1999) in 1999 mining contributed approximately25% of the country's GDP, 48.5% of PNG's total exports and in the same year new exploration was approximately US$25 million.

The Mining Sector of the Solomon Islands - The mining sector of the Solomon Islands is centered on the US$63 million "Gold Ridge" mine which reached full production in 1999 but was forced to close in 2000 due to political unrest in the country. Intermittent exploration continues in other areas of the country primarily for porphyry copper type mineralization, massive sulfide mineralization as well as for epithermal gold.

Given this highly diverse set of nations, each with its own unique mineral sector or mineral potential, it is difficult to define common elements of an "Pacific Islands'" mining sector, nevertheless, there are some commonalities that are worth of note:

1. The mineral sectors of the majority of the PICs were developed, and continue to be developed (with a few notable exceptions) with few or no sustentative inputs from local communities.
2. The direct sharing of national resource rents (fiscal receipts) from mining activities with Local Government Units (LGUs) and local communities has not been, and in most countries is still not, a common practice.
3. In all nations where mining has taken place, or is taking place, there are large environmental and social liabilities associated with existing and past mining operations that have to be addressed by government, industry and the local community. These issues have a major impact on fiscal resource allocation.
4. In virtually all countries, there is a perception (in many cases real) that resource depletion and development have taken place without a commensurate improvement in the quality of life (sustainable development). This is particularly true at the Provincial and local levels of government and within the populous as a whole.
5. Overall, there is a broad-based dissatisfaction with the present nature of mining and the allocation and use of the fiscal receipts derived from mining activities.

In the remainder of this paper the author will deal in general with many of the above areas of concern with respect to mining activities in the PICs and specifically with the relationship of resource rent revenue sharing to resolving and/or mitigating many of these concerns.

4. Understanding Resource Rents

The classic concept of economic rent originated in the initial studies of David Ricardo (1962) in his theory of land rent and has been subsequently applied (Garnaut and Ross 1975, 1983) to mineral resources development overall and to mining in particular. In the case of mining, Ricardian economic rents can be viewed as the excess of economic return on a project above the total economic cost of the project. This is the context within which the present discussion of resource rents is framed. In the case of natural resources, governments often transfer selected property rights to industry, such as the right to mine an area or to exploit an area, in exchange for some amount of economic rent. These economic rents collectively are known as "resource rents," since they are derived from the utilization of natural resources, are defined within the fiscal regime of any nation.

Table 2: Major Mines and Exploration Projects in the Mineral-Rich Pacific Islands

Country	Major Mines Prospects	Commodities	Size	Status
Fiji				
Operational	Vatukoula	Gold and Silver	Medium	Closure Planned
Non-Operational	Namosi	Copper and Gold	Large	Exploration
Nauru				
Non-operational	Nauru	Phosphate	Medium	Closed
New Caledonia				
Operational	Kouaoua	Nickel and Cobalt	Large	Operational
	Nepoui-Kopeta	Nickel and Cobalt	Large	Operational
	Thio	Nickel and Cobalt	Large	Operational
	Tiebaghi	Nickel and Cobalt	Large	Operational
	Bienvenue	Nickel and Cobalt	Medium	Operational
	Tontouta	Nickel and Cobalt	Medium	Operational
Non-Operational	Koniambo	Nickel	Large	Pre-feasibility
	Goro	Nickel and Cobalt	Large	Feasibility
	Nakety	Nickel	Medium	Feasibility
Papua New Guinea	Ok Tedi	Copper and gold	Large	Closure planned
	Porgera	Gold	Large	Operational
	Lihir	Gold	Large	Operational
Operational	Misima	Gold	Medium	Closure planned
	Tolukuma	Gold and Silver	Small	Operational
Non-operational	Panguna	Copper and gold Gold	Large	Closed
	(Bougainville)	Nickel and Cobalt	Medium	On hold
	Simberi	Gold	Large	Development
	Ramu Nickel	Copper and Gold	Small to	Feasibility Study
	Morobe Gold	Gold	Medium	Pre-feasibility
	Project	Gold	Large	Exploration
	Freida Copper		Medium	Exploration
	Mount Kare		Copper and	
	Wafi		Gold	
Solomon Islands				
Operational	Gold Ridge	Gold	Medium	Closed

The fiscal regime, can be viewed as the totality of that nation's economic policy and the economic instruments for implementing that policy which impact on a mining enterprise. Normally these instruments are in the form of direct and indirect taxes and tax incentives that determine the profitability of the enterprise and the return to the government from resource utilization. In the following, a brief overview of the major fiscal instruments of a fiscal regime are briefly reviewed. It should be noted, as pointed out by Fortin (1992) the fiscal policy and regime of one

nation cannot be easily "borrowed" from another nation since fiscal regimes, in particular, are the product of specific circumstances - which will undoubtedly be the case with respect to the development of deep ocean mineral resources.

Components of a Mineral Sector Fiscal Regime - Mineral taxation methods are varied in form and application within individual Governments, however, in the final analysis, the taxation structure of a nation often determines (a) whether or not a given project is economically viable and (b) the Government's share from the exploitation and utilization of a nations' resources. For the majority of Nations, the taxes levied on a mineral development are either direct or indirect (Garnaut and Ross, 1975, 1983). Among the most common direct taxes, taxes paid directly by the company to another entity normally the Government, are the following:

Direct Taxes*:*

Income Tax: Often called a profit tax an income tax is normally a percentage of the profits of an enterprise.

Royalty Tax: Often called a production tax the royalty tax is normally a percentage levied against the amount of a commodity produced or the sale price of the commodity produced. There are, however, many variations used in the calculation of the royalty tax.

Import Duty: A tax levied against the value of imported equipment and materials used in a mining enterprise. Normally, not all imports are taxed and this tax is often highly discretionary.

Export Tax: A tax normally levied against the value of the commodity exported. If the commodity is sold domestically it is normally subject to a sales tax in lieu of an export tax.

Withholding Tax: A tax levied on the remittance of profits or dividends abroad. This tax is normally levied on nonresidents but may also apply within certain corporate structures.

Local Taxes: In many nations the Provincial and or Local levels of Government often have vested rights to tax mining activities - these taxes are often called use taxes as they include taxes for education, roads and property.

Fly In - Fly Out Tax: A tax levied by the government on the value of the travel and related costs associated with flying personnel from their home base to their duty station (mine) in a country.

Other Taxes: In addition to the above there are normally a large number of other direct taxes that are levied against a mining activity. These include, but are not limited to the following: Rental Fees, Registration Fees, transportation, water, environment (compensation fees) and in special circumstances a value added tax (VAT).

Indirect Taxes

Landowner Compensation - Normally a fee paid directly to the owner of the land upon which the mining activity will take place or, in rare instances, paid directly to the national government.

Local Component Rules - In many Nations there are strict rule with respect to the use of domestic goods and/or labor, normally a percentage of the total, which may result in increased costs. Additionally, many Nations have a requirement for the Company to participate in overall development that is an addition cost.

Foreign Exchange Rules and Regulations - Normally imposed in such a way that the Company experience foreign exchange losses or encounters increased transaction costs when exchanging or transferring foreign exchange. In specific cases of borrowing within the country additional taxes may also be imposed.

Equity Participation - Normally takes the form of free equity participation in a project in extreme cases but usually is a carried equity interest, also known as deferred equity, which allows the Government to put up its equity share from future earnings.

Transfer of Technology and Know-How - Most commonly applies to the cost of acquiring and transferring patents or other proprietary property to the host country as a condition of undertaking the mining activity.

Two additional types of resource rents that are associated with many mining projects are (a) landowner compensation and (b) national/local equity participation in resource development projects. In the former, the revenue derived may be quite high, accrue on a yearly basis (normally for the life of the development and in some cases beyond) and be shared by a very small number of people. In the latter case, the national government, and occasionally the government at the provincial level, becomes an actual partner in a project, thereby, acquiring a percentage of the profits in addition to taxes and fees. As the equity partner is normally the national government or its agent, the majority of revenues from profit sharing accrue to the national government. This latter activity may or may not make resource rent revenue sharing with Local Government Units (LGUs) more difficult as will be discussed later.

As a general rule, albeit with some major exceptions, the majority of direct taxes accrue to the national treasury while the majority of the fees, and often a portion of royalties, accrue to the LGUs. This, however, results in a majority disparity in revenue distribution as taxes, which accrue to the national government, normally constitute 90+% of all derived revenues from a mining project. Hence the call by LGUs in most nations for a more equitable division of resource rents: philosophically a valid request, however, one that is difficult to implement in practice.

Tax Incentives - In addition to the above direct and indirect taxes which together comprise the resource rents that a nation imposes on the mining industry, there are a number of fiscal instruments, in particular tax incentives, that are included in a nation's fiscal policy and that overall reduce the amount of resource rent that a nation acquires.

Tax Holiday - An initial period of time in which a mining enterprise is not subject, or only partially subject, to all types of tax liabilities. Normally this period is approximately 5 years and in special cases 10 years or more.

Deductions Against Income Tax - Covers a range of issues such as depreciation, amortization and depletion allowances that can be deducted as costs, thereby, reducing taxable income. Deductions are commonly only allowed for certain types of equipment or for specific expenditures. Special approaches have been developed in many countries to either speed up (accelerated depreciation) or slow down (defined number of years) individual deductions.

Interest Deduction - As mining enterprises are capital intensive the common practice to finance the ventures is through loans. Therefore, most Nations have provisions for allowing the deduction of all or part of the interest on borrowed money.

Loss Carry Forward - Largely because of the cyclical nature of the mining industry companies enjoy profitable years and endure years of loss. In the years of loss, the amount of the loss can be "carried forward" as a cost and deducted from taxable income in subsequent profitable years. The terms of loss carry forward, particularly with respect to the applicable time, is often specified. The converse of loss carry forward is "loss carry back" which requires an amended tax return.

Tax Credits - A deduction from taxable income allowed by the Government specifically for investment of profits in the country. The amount of deduction is normally a percentage of the amount invested domestically. Normally granted by the Government.

Although the number of direct and indirect taxes is large, it should be noted that the number of potential tax incentives, which can also dramatically impact the profitability of a mining enterprise, are also quite numerous and are very important. Overall, the fiscal regime of any nation must have sufficient flexibility to be able to accommodate the national policy with respect to mineral development while, at the same time, assure the government of a reasonable "take", in terms or resource rents, from the exploitation of the Nation's resources.

Protectionist Practices - While most nations do not change their mineral policies at every peak and dip in market conditions, many adopt measures to ensure a continued and uninterrupted positive contribution of the mining sector on economic growth. The direct and indirect benefits of mining activities can be substantial and may therefore be worthy of safeguarding or protecting if economically feasible.

Protectionist policies that apply to the mineral industries in developing countries can be grouped into three general categories (Lum et.al. 1995, Otto and Dorian, 1989): (1) policies that subsidize domestic production, (2) policies that restrict imports, and (3) policies that attempt to stabilize the flow of revenues from the mineral industries to a government. Examples of the first group include price supports, government-provided infrastructure (that is, ports, rail, roads, power, water), low-cost financing, loan guarantees, national marketing organizations, advantageous exchange rates and so forth. In general, subsidies, such as those mentioned here, can be used to reach two objectives: to promote domestic consumption of domestically produced minerals and to provide a competitive advantage to externally marketed minerals. Policies from the second group, which act to restrict imports, include direct tariffs (specific and *ad valorem*), exchange controls, quotas, orderly marketing arrangements, bureaucratic controls, and voluntary trade agreements (usually referred to as voluntary export restraints). The third set of policies, which seek to stabilize fiscal earnings, use methods such as resource stabilization funds and commodity stabilization schemes.

Table 3 lists the various methods available for protecting infant industries, including mining. This matrix is specific to resource-rich island countries, such as Papua New Guinea. Table 3 is intended to subjectively illustrate the extent of impact or contribution a particular method can have in achieving an objective. For example, government-provided infrastructure can be used as a direct or indirect means of facilitating regional or local development, but only indirectly as a means of increasing market share. Owing to the heterogeneous nature of PIC mineral industries and economies, the matrix shown in Table 3 would vary considerably by country.

5. The Nature of Resource Rents

Historically, in most PICs resource rents have been remitted to the national treasury and became part of a general fund that was then apportioned, according to a national development plan, through an Internal Resource Allocation (IRA) process to the individual provincial and local governments. This procedure, however, has been and continues to be criticized by Local Government Units (LGUs) on the basis that it does not fairly or adequately compensate for (a) the use of the resource, (b) the accompanying social, economic and environmental impact of resource development and exploitation, (c) the longer-term social and environmental costs that are associated with rehabilitation, reclamation and readjustment and (d) provide for sustainable development of the local area once the resources are depleted. Perhaps equally important the LGUs argue that they do not have an adequate role in determining either how the level of resource rents are determined or how they will subsequently be used at the local level since the IRA is in support of the national development plan.

In addition to the above general problems with resource rent revenue sharing, there are a number of issues directly related to resource rents that further compound existing problems. These include (a) the stability of resource rents, (b) the timing of the receipt of resource rents, and (c) value added resource rents that are briefly discussed in the following:

Stability of Resource Rents - Perhaps the most critical aspect of resource rents derived from mining is that of the long-term and/or short-term price instability resulting from changes in the international economy and the resultant supply and demand for commodities over time. International commodity prices have been characterized by generally long-term stability and short-term volatility (major changes in a short period of time) that leads to instability in government derived resource rents. This makes it difficult for national government, and even more difficult for LGUs to plan for development based on resource rent revenues. The instability in prices and revenues

has an even greater impact on the LGUs of a nation, particularly, if a substantial amount of their revenues are tied to resource rents, because the LGUs, unlike the national government, often do not have access to other sources of revenue (as does the central government) with which they can stabilize revenue flows over time.

The Timing of Resource Rents - The extractive industries overall (oil, gas and minerals) and minerals in particular have a number of common characteristics which directly influence the timing and amount of resource rents that will accrue to the national government and de facto to the LGUs as part of resource rent revenue sharing. The most important of these characteristics are presented, and their impacts summarized, in the following Table 4.

An irony of the mining industry is that although the absolute amounts of money invested are enormous (US$ billions) the reality of the industries, in most cases, is that after the large capital investment is repaid and the costs of the operation are deducted, the majority of projects have a relatively low Internal Rate of Return (IRR) for the company (normally from 13-20%) and a modest Net Present Value (NPV) for the government (approximately 50-60% of profit).

The low NPV to the government is largely attributable to the fact that (a) the majority of actual revenue flows are initially deferred for several years and (b) actual revenues are received over an extended period of time. This deferred and extended receipt of resource rents from natural resource development projects is of critical importance

Table 2 Near here

Table 4. Resource Development, Resource Rents and Social and Cultural Issues and Impacts

Issue	Result
They are capital-intensive enterprises often requiring more than a billion US$ to complete.	The capital expenditure must be recovered by the company before it begins to pay taxes - this may mean 3-7 years without significant tax revenues to the government.
Such projects almost always require/receive special fiscal packages from the government to facilitate development.	Negotiations almost always result in lower taxes and additional costs to the government (particularly for infrastructure) that reduces government revenue and adds costs.
Normal development times are measured in several years.	During development the government receives no revenues even though it may be incurring substantial costs.
The social, cultural and economic impacts during development are large - particularly on the local communities.	Major costs accrue to the provincial and local governments to support the development phase, however, no revenue is received.
The projects are short term, 10-25 years, in most cases.	The time frame during which government receives revenues is (a) deferred, (b) relatively short and (c) is terminated abruptly with the closing of the operation.

to the entire discussion of resource rent revenue sharing in that resource rents do not accrue to either the national government or the LGUs when they are most needed, i.e., at the beginning and the end of a natural resource development project.

Value Added Resource Rents: Of particular importance to developing and emerging economies such as the PICs is the issue of value added resource rents, i.e., the additional resource rents that can be collected by the government because of subsequent processing and/or utilization of the raw materials within the country. Although the capture of value added resource rents is an excellent policy option for some countries, such a policy must be implemented on the basis of economic viability (not national pride) to ensure that there will be actual revenues to the government and within a reasonable time frame. Within the PICs, Papua New Guinea has considered, and rejected, proposals for the development of gold and copper smelters, because the projects were not economically viable for them, has recently approved the development of a cobalt/nickel refinery for the processing of nickel laterite ores from the Ramu project and the Cook Islands are considering on land processing of manganese nodules even with the high associated environmental costs.

6. Key Issues in Resource Rent Revenue Sharing

The major driving force behind resource rent revenue sharing movements within the nations of PIC is that of "people empowerment" which, although it varies somewhat in form and intensity between nations, has in common the desire for the "average" citizen, through the LGU, to have a larger role in determining government policy and a more equitable participation in the fruits of economic development. The latter provides the primary linkage between the individual's desire for fiscal decentralization of resource rents. It should be noted that this discussion deals with fiscal decentralization in the context of mining related fiscal revenues and as such is a subset of the larger issue of fiscal decentralization of a nation's total fiscal receipts. Nevertheless, the basic problems in all four areas of decentralization (as discussed previously) are encapsulated in the issues surrounding the allocation of fiscal receipts from mining.

Although fiscal decentralization, with the resultant resource rent revenue sharing is clearly a worthy goal within the PICs the actual carrying out of the process presents numerous problems, a detailed discussion of which is beyond the scope of the present paper. As a result in the following three key issues, internal resource allocations, costs of establishing new projects, and management, which arise with respect to fiscal decentralization of resource rents government decentralization are the focus of the discussion.

Internal Resource Allocations versus Resource Rent Revenue Sharing - Virtually every nation has in place a well-established procedure for the transfer of funds, internal resource allocations (IRA) from the national treasury to the LGUs in support of activities under the National Development Program (often a Five-Year Development Plan). This transfer of funds is usually "earmarked" for support of the LGUs, social services and for specific national development projects, which have been formulated at the national level. Such IRA funds, therefore, have three very important attributes, i.e., (1) they are directly or indirectly controlled by the central government, (2) they are allocated on the basis of overall national development planning, and (3) they are allocated without regard to the financial contribution that is made to the national treasury by a local area, e.g., resource rents paid to the State, by industry, for the development of the local areas natural resources.

Further complicating the issue is the fact that the government's normal IRA procedures for the distribution of national (non-resource rent) funds to local governments are usually focused at the Provincial level where the funds are used for the broader social and infrastructure needs of the Province. As a result the LGUs have little or no latitude in the expenditure of the IRA funds to accommodate needs resulting from resource development.

This often requires that the national government provides additional funding, a supplemental IRA, for use at the local level/s. However, it should be noted, that such supplemental IRA allocations invariably result in "turf battles" between the Provincial government and the smaller LGUs with respect to how (and when) the monies will be transferred, who will have control of the monies and who will set the priorities for projects. Equally important are "turf battles" that may develop between competing NGOs, who wish to direct expenditures to individual projects of special interest, or to supplement Overseas Development Assistance (ODA) monies for the support of specific projects (commonly infrastructure that would support resource development undertaken by the donor nation's industry).

Even more acute is the overall problem of how the national government will address the issue of IRA, and supplemental IRA funding, once the LGUs begin to receive significant funds from the resource rent revenue sharing. At this point the national government normally wishes to (a) curtail all supplemental IRA funding and (b) reduce normal IRA funding with the expectation that the LGUs will undertake development activities and provide social services from the resource rents they receive. To a large extent the resolution of these issues is made simpler or more difficult depending on the magnitude of the resource rents received.

Resource Rent Sharing and the Costs of Establishing New Projects - As emphasized earlier a fundamental difficulty with resource rent sharing in most countries is that the timing of the flow of funds to the LGUs is often exactly opposite to the timing of the actual need.

This dichotomy arises because the timing of the receipt of LGU resource rent revenues from a resource development is directly linked to the timing of central government resource rent collections from a project. The norm is that the level of resource rent receipts increases over time as development proceeds and initial capital costs for the project are written off by industry. As a result, actual revenue receipts and significant resource rent revenue sharing may be delayed for several years. This problem is further exacerbated by the fact that many governments grant a "tax-free holiday" to investors that in most cases further delays actual receipts from a project. However, the need for local government expenditures, to establish needed social services and infrastructure in a new area, are at their greatest during the construction, development and early operation phases of a project, before any tax revenues are collected by government and can be transferred to the LGUs.

As previously discussed, the obvious resolution of this dilemma is for supplemental IRA funding to meet these early establishment expenses. However, a number of questions immediately arise such as: (a) How is such an initiative to be mounted?; (b) What will be funded?; (c) How long will there need to be a national presence and funding in the area?; (d) Can the local government cope with a sudden expansion of needed services? and (e) To which levels of local government should the support be funneled? In trying to alleviate these critical establishment problems the national government must tread carefully if it is to avoid total dependency of the LGUs on the national government and, thereby, the usurpation of its own decentralization strategy.

Two of the most constructive approaches are (a) the use of Joint Development Task Forces (JDTF), composed of government officials from all levels as well as industry and NGO representatives, who can anticipate and develop appropriate transitional plans and (b) the implementation of a periodic rapid field assessment programs

which periodically assesses the success of ongoing activities and identifies emerging issues which the JDTF may address.

Resource Rent Revenue Sharing and Management - The fiscal decentralization of resource rents focuses on the transfer of a significant amount of authority and responsibility for operational and decision-making activities, over a broad spectrum of activities, from the national government to local government units. In the transfer of power there are two key issues that must be recognized and addressed if decentralization is to be successful.

First, it is essential to recognize that fiscal decentralization has two components, i.e. a vertical distribution of decentralized factors (between levels of government) and a horizontal component (among the units at each level). All too often the vertical component is fostered without the concurrent assurances for horizontal dissemination - particularly to ethnic minorities and disadvantaged populations.

A particular problem with horizontal resource rent revenue sharing in the PICs is that existing social and cultural norms of ethnic grouping often take precedent over the newly induced responsibilities resulting from fiscal decentralization. This problem is particularly acute in some areas where diverse ethnic groups with traditional agendas for development or traditional patterns of leadership and wealth sharing, which exclude certain groups or individuals, are firmly entrenched. In such circumstances the degree of horizontal dissemination associated with resource rent revenue sharing is severely limited.

Second, for vertical and horizontal resource rent revenue sharing to be successful, it must be effectively transferred through the various levels of government and reach the lowest levels where it is normally intended to operate. In such a process two problems occur, e.g., (1) all too often the intermediate levels of government are not included and resource rent revenue sharing becomes a national to local level process and (2) management capacity is not developed commensurate with the levels of new responsibilities. In the first case, the key agencies responsible for serving as the liaison between the national and local levels of government are not able to carry out their responsibilities, in particular, very critical oversight responsibilities and the training of lower level government officials. In the second case, at the lower levels of horizontal resource rent revenue sharing activities, there is a decided lack of competent management personnel or management training to ensure that the responsibilities and obligations resulting from decentralization are carried out.

In addition to the above issues, which are largely related to management and personnel issues, there are a myriad of other issues that are too often normally overlooked or in extreme cases ignored. As examples, the failure to provide necessary support facilities (cars, telecommunications, laboratories, technicians) for the LGUs new responsibilities is a common problem as are problems of recruitment and training of personnel and the purchasing of goods and supplies.

In summary, the most fundamental deficiency of the fiscal decentralization resource rent sharing activities is that the LGUs are, with few exceptions, unable to immediately and effectively assume the new duties and responsibilities they have been given. As a result, there is a critical need to define and implement a more reasoned and sequential approach to the decentralization and resource rent sharing processes overall and as it pertains to mining related developments in particular.

In addition to the above problems inherent in the process overall, there are the additional problems that are specifically associated the with mining activities that, in many cases, have led to governments' programs for resource rent revenue sharing being initiated. Although these problems vary greatly in scope and impact, they have one common attribute with respect to decentralization and resource rent revenue sharing, i.e. resource rent revenue sharing almost always leads to the creation of areas that have proportionally more "wealth" than other areas and to inequalities in development if the process is not managed carefully. Therefore, there is a critical need at all levels of government to develop an understanding of the impacts of mining projects, in the context of decentralization and resource rent revenue sharing, so that the impacts are anticipated, planned for and mitigated at the national through local levels of government.

7. Stabilizing Resource Rents

Many of the above problems encountered by raw materials exporters, such as the mineral-rich PICs, related to resource rent revenue sharing, are derived from price instability, which can lead to widely fluctuating export earnings. Market stabilization can be viewed as a means of maintaining a stable flow of income to a producer country during times of price instability or even worsening terms of trade. Changes in export earnings to producer countries are reflected in balance of payments movements, which can affect an entire economy. There are two ways to address the problem of fluctuating export earnings; either deal with its causes directly by stabilizing commodity prices in world trade, or reduce the changes in the income to the producer country. (The stabilization of world commodity prices is not necessarily the same as stabilizing a particular country's export earnings.)

In addition to price stabilization, another way of dealing with fluctuating export earnings is to make available a revenue stabilization fund, such as that established in Papua New Guinea (Lum et.al., 1995), which accumulates in periods of high export prices and utilized during recessions. Revenue stabilization may be defined for purposes here as policies that promote a predictable level of minerals-derived government revenues. This includes both revenues obtained from state-owned enterprises as well as taxes collected from private industry. Subsidies, in the context of revenue stabilization, can act as a two-edged sword. They can keep an industry in existence during downturns (thus promoting long-term revenue stabilization), and because they are also a form of government expenditure, they can actually worsen short-term net revenue stability during a downturn. Where a country is able to meet its domestic needs internally, trade barriers can act to keep revenues from taxable domestic operations at an artificially high level during downturns in world demand. Trade barriers would not make sense as a means of stabilizing revenues for a minerals-exporting country, except in rare cases. The Papua New Guinea Stabilization Fund is discussed in the following.

8. The Pacific Islands Experience: Papua New Guinea

Papua New Guinea is a minerals-led economy (oil, gas, base and precious metals) with mining accounting for almost 25 (approximately US$800 million) in 1999 down from the over 1 billion U.S dollars and 83 percent of total export receipts in 1991. Currently there are 5 major mining operations and another 3 projects under development (Table 2) as well as numerous other prospects and small alluvial mining operations. In 1999 Papua new Guinea produced65, 747 kg of Au, 66,542 kg Ag and 187,921 tonnes of copper (Table 5).

Table 5: Papua New Guinea Mineral Production, 1987-1999

Year	Gold (kg)	Silver (kg)	Copper (tonnes)
1987	34,903	62,224	217,699
1988	34,593	68,915	218,642
1989	25,380	92,507	203,825
1990	32,323	112,327	170,221
1991	59,810	123,630	204,459
1992	69,231	93,108	193,359
1993	60,096	96,017	203,184
1994	58,654	77,758	206,368
1995	51,701	65,153	212,737
1996	51,573	59, 036	186,665
1997	48,482	49,165	111,515
1998	61,641	59,294	152,200
1999	65,747	66,542	187,921

Source: Asian Mining Yearbook, 2000

Gold and copper have been Papua New Guinea's leading export earners since 1972, when the Bougainville mine commenced full production.

Minerals indeed play a major role in Papua New Guinea's overall economic structure. Since the 1970s, geological exploration in Papua New Guinea has led to the development of the world class Ok Tedi and Bougainville copper, gold, and silver mines, and contributed to the identification of many promising mineral prospects. Papua New Guinea is extensively endowed with minerals, as demonstrated by the recent intensification of exploration activities. Exploration expenditures in Papua New Guinea have been highly cyclical in Papua New Guinea largely "tracking" changes in international metal prices and changes in Papua New Guinea's mineral policy. In 1999 mineral exploration was approximately US$25 million, representing a sharp decline from exploration efforts in the early 1990 when there were about 110 active prospecting authorities covering an area of about 15 percent of the country. Average annual exploration expenditures ran at more than $U.S. 100 million each year during the 1980s (Chan, September 1992).

With an abundance of copper and gold production, the nation can export these metals abroad, promoting export earnings and government revenues. More than 10 percent of Papua New Guinea's per capita income was traditionally attained through the sale of copper, gold, and silver from Bougainville Copper Ltd. alone. Mining has been a major export earner in Papua New Guinea since the early 1970s when Bougainville began producing copper. In the 1980s and early 1990s the contribution of mining to GDP was boosted by new production at Ok Tedi (May 1984), Porgera (August 1990), Mt. Kare (1991), Tolukuma (1995) and Lihir (1998), and intensified exploration expenditures for minerals, oil, and gas. By 1995, export earnings from minerals had peaked at 1.8 billion U.S. dollars.

Mining in Papua New Guinea had a setback on Bougainville during November 1988, when acts of sabotage started at the Panguna mine operated by CRA subsidiary, Bougainville Copper Ltd.. In May 1989, the mine stopped all operations. The sabotage was connected with issues concerning landownership, dissatisfied landowners, and secessionist sentiments. The mine remains closed although negotiations to re-open are continuing. Attempts to resolve the crisis are having little success. Currently, the PNG government is restoring services on Buka Island to the north of Bougainville Island. The long-term political status of Bougainville is being addressed as part of the continuing discussions. The return of services to Bougainville, particularly health, education and communication, is considered an urgent priority.

Economically, the closure of the Bougainville mine has had a significant impact on Papua New Guinea's export earning and government revenue, for it has deprived Papua New Guinea of about 20 percent of its exports. With good government foresight, this impact was cushioned temporarily by the existence of gold and copper reserves and a mineral resources stabilization fund. Since 1972, the mine has provided 45% of gross exports and contributed 17% of the central government's total internal revenue. The mine generated more than US$1.5 billion between 1972 and 1989; until 1988 it contributed 17% of Papua New Guinea's internal revenues (*Mining Journal*, January 25, 1991a). Over the 18-year period, Bougainville Copper accounted for 12% of GDP and 45% of export income.

Since 1989 nearly US$100 million has been used since 1989 by the Papua New Guinea national government to quell the Bougainville uprising (Seneka, November 5, 1992). Each year, the government uses an estimated total of US$40 million to subsidize military and police activities and the current rebuilding program on Bougainville. Reportedly, about US$30 million to US$50 million is needed to restore normal services to Bougainville.

Prior to the dispute over distribution rights, the Papua New Guinea government paid a share of production royalties it received to the provincial governments and to Bougainville landowners in the ratio of 95:5. After the initial uprising activities, the government altered the proportion to provincial governments to 80%, allocating 5% to landowners, 5% to local projects, and 10% for investment into future generations. Before its shutdown, Bougainville had consistently operated at a profit. A massive capital improvement program in the 1980s had ensured at least an additional 15 years of operation, with the possibility of an even longer life if additional low-grade reserves are developed.

Creation of the Papua New Guinea Stabilization Fund - The importance of copper and gold exports to Papua New Guinea's economy forms the basis for the nation's mineral strategies, which basically evolved from experiences with the Bougainville Copper Ltd. mine. The government of Papua New Guinea recognizes that mining

contributes significantly to their nation's economy via export earnings and internal revenues but that it contributes little in terms of jobs or stimulus to existing industries or the creation of new ones. As a result, the National Development Strategy of 1976 emphasized mineral projects as a potential source of revenues, enabling the newly independent country to achieve national goals. Thus the importance of maximizing revenues and encouraging a stable investment climate in mining was stressed (Goodman et al., 1985).

Since the revenues generated by mining projects fluctuate because of changes in metals prices and other factors, the government of Papua New Guinea established a Mineral Resource Stabilization Fund (MRSF) in 1974 to prevent the destabilizing impact of fluctuating revenue flows. These can be significant in Papua New Guinea since minerals account for about half of all export earnings and a large percentage of internal revenues. The MRSF thus dampens revenue flows to Papua New Guinea's government when they are increasing and supplements them when they are decreasing.

As noted by Lum, et. al. (1995) the MRSF directly receives all national government revenue in taxes and dividends from major mining projects and dispenses to the national budget only those annual amounts deemed to be sustainable in real terms over five years (Daniel, 1985). The fund is managed by selected senior public servants, who face a difficult task in continuously monitoring the international copper and gold markets. Funds are required to be drawn by the central government in a regular and orderly manner so as to insulate fiscal revenue from fluctuating export proceeds. It was originally intended that the managers of the fund would each year report expectations of future mining revenue and provide recommendations about the level of drawings to government revenue that were sustainable in real terms for five years (Parsons, 1990). It was also intended that the board's recommendation on the amounts to be dispensed to the budget would not vary from year to year by more than 20 percent in real terms, although Papua New Guinea's Minister of Finance had the option to vary the amounts by an additional 10 percent (Daniel, 1985). Since the actual calculations depend upon predicted inflation for the next fiscal year, the real value of the amounts transferred may vary only slightly when inflation rates become known.

Table 6 shows deposits with MRSF for the period 1980-2000 (1980-1995 given as 5 year averages) and

Table 6. Table 6 needs a title

	1980	1985	1990	1995	1996	1997	1998	1999	2000
Total receipts	109	23	120	282	424	452	311	309	20
Company tax	73	15	92	257	405	391	241	259	20
Dividends on Government Shareholdings	21	3	11.5	0	0	17	0	35	0
Other receipts	1	3.5	8.8	25	19	44	70	15	0
Transfers to central Government budget	57	32	85	170	195	287	330	986	20
Net Change in fund balance	52	-9	35	112	229	165	-19	-677	0
Balance at end of period	4	53	135	302	531	696	677	0	0

Source (Lum, et. al., 1995 and IMF, 2000)

Table 6 is of particular interest in that it clearly shows the impact of international commodity prices such as in 1980 when the fund was only 4 million Kina largely because of the oil price crisis of 1979/80 or the high prices for copper and gold in the mid-1990s when the fund balance reached its highest historical level.

Through much of the 1980s, the MRSF was generally successful in achieving its original intent of creating a buffer between Papua New Guinea's national treasury and mining receipts (not shown in the table is the virtual depletion of the fund in 1978-1979 by the government to balance the nation’s budget following independence.) With the tremendous expenses associated with the startup of the Ok Tedi mine in 1986, Papua New Guinea's current account deficit rose sharply in that year. Finance Minister Julius Chan therefore attempted to reduce the deficit by drawing on the MRSF. In 1986, the fund amounted to K75.3 million and was subject to a government-imposed maximum twenty percent withdrawal (Howard, 1991). In 1987, however, the government abolished the twenty percent limit rule, and withdrew an astounding K60.5 million from the fund, anticipating that future increased

mining activities would alleviate any reduction. No one suspected at that time that the Bougainville mine would shutdown by the end of the decade. Legislation in 1987 provided the Papua New Guinea government more discretion to make yearly withdrawals, but they are still subject to a specific parliamentary vote of approval. The Bank of Papua New Guinea has sole responsibility for investing the MRSF.

9. Near Collapse of Fund: Post Bougainville

While the MRSF was considered largely successful during the past decade, changes in the allocation of revenues to the reserve have weakened its position. With the closure of Bougainville in 1989, Papua New Guinea's stabilization fund was used nonetheless to alleviate the impact of dramatically declining mineral revenues. While its existence eased the adjustment to revenue volatility, the shutdown of Bougainville has had tremendous economic repercussions on Papua New Guinea's overall economy. The PNG government intended on drawing about $U.S.85 million in 1989 from the fund, or seven percent of its revenue needs, which was equivalent to just more than half of the revenue from Bougainville in the boom year before its abrupt closure (Auty, May 1991).

Heavy withdrawals from the fund in the early 1990s have depleted much of the MRSF reserves, even though taxes from the expanding Ok Tedi mine and new producing gold mines were expected to contribute to a rebuilding of the reserve base. In 1990, the end-of-year balance of Papua New Guinea's stabilization fund dropped to K90.3 million, while a year later, it rebounded slightly to K104.1 million (Ministry of Finance, 1992). In 1992, Papua New Guinea's government had projected that the MRSF contribution to central government internal revenues would rise from zero percent in 1991 to 12.2% in 1995 (Ministry of Finance, 1992). This compares with an average contribution of 7.2% between 1985 and 1990. In nominal terms, the value of this tax will rise from K138 million in 1991 to K418.4 million in 1995.

When the Mineral Resources Stabilization Fund was established in 1974, dividends from both equity and taxes were used to build the reserve base. Towards the end of the 1980s, however, at government request dividends from equity were redirected to a new Mineral Resources Development Corporation (MRDC), a state-owned enterprise intended to take up state equity in mining projects, to boost the value of Papua New Guinea's mineral resources, and maximize profits by encouraging full participation by Papua New Guinea's in a less costly manner. MRDC was formed in 1988 by the Namaliu government to overcome growing difficulties in the country's mining sector. MRDC is the parent company of Petroleum Resources Kutubu, a company managing Papua New Guinea's 22.6 percent stake in the major Kutubu oil project, worth about K360 million.

With the redirection of receipts from equity in projects away from the Mineral Resources Stabilization Fund, the capital reserve has lost a major contributing component. Moreover, significant tax revenues from the Misima and Porgera projects will not be forthcoming for several years until the initial capital expenses are paid off. While tax revenues from Ok Tedi continue, in September 1988 the gold leach circuit was closed down, and the mine became dedicated to copper concentrate production. And the stabilization fund's most mature tax provider--Bougainville--is presently shut down with no immediate plans for restart.

In 1992, the Papua New Guinea government was in danger of enlarging its deficit by spending outside the budgetary limits. Preliminary estimates of fiscal operations showed a deficit of K48.6 million in the first six months of the year (Vulum, September 10, 1992). Total revenue increased by 8.4 percent to K520 million, with all taxation revenue in line with budgetary expectations. Most of the major components of taxation revenue were higher during the first half of 1992, reflecting payments made by the mining companies into the Mineral Resources Stabilization Fund. Company tax receipts more than doubled. Dividends from taxes are paid into the stabilization reserve rather than directly into government consolidated revenue so as to stabilize income between good and bad years.

Beginning in 1998 a period of draught that severely impacted agriculture and decreased mining revenues (due to an inability to get supplies in and out of Ok Tedi and other mining areas) coupled with the impact of the Asian financial crises and poor fiscal management in the Papua New Guinea government led to a significant shortfall in government revenues. As a result, the stabilization fund was reduced to zero in 2000 (Table 6). The fund is apt to remain deleted for some time as the nation faces a continuing financial crises, declining metal and petroleum prices and continuing demands by the provinces for larger revenue sharing stakes. Papua New Guinea’s stabilization fund has served the nation well. What its future holds is unknown.

10. Stabilization Funds and the “Dutch Disease”

Although the primary function of Papua New Guinea's MRSF is to provide a basis of stable revenues for government expenditure, such funds have an important secondary role in dampening the impact of the "dutch disease" syndrome (Gregory 1976, Snape 1977, and Neary and Van Wijnbergen, 1986) on resource-rich economies. The "dutch disease" was originally coined to describe the effects of offshore gas discoveries on the economy of the Netherlands and has since been expanded to encompass similar effects in virtually all minerals- and energy-led economies. In its simplest form, the "dutch disease" syndrome defines the mixed blessings that arise from rapid increases in foreign exchange, derived from the export earning of raw materials, on a nation's economy, i.e., rapid growth in the export sector and declining growth in the non-traded sector (in particular agriculture). The syndrome of the dutch disease can be described as follows:

- initial large inflows of foreign capital and diversion of domestic resources into the new export (resources) sector;
- inflow of foreign capital resulting in higher wages and prices and decreased competitiveness of pre-existing export or import-competing industries;
- rapid expansion of government personnel and services and large expenditures on large scale domestic projects and/or subsidies; and
- expanding budget deficits, causing increased borrowing and a deteriorating balance of payments position.

With declining revenues, the government is faced with weakened and non-competitive pre-existing export industries, large government payrolls, and continuing large expenditures on services previously initiated.

In Papua New Guinea, the impact of the "dutch disease" syndrome on the economy has been largely dampened by the establishment of the MRSF which prevented the release of large amounts of foreign exchange earnings directly into the economy, controlled and stabilized the rate of revenue inflow over time, limited expenditures on large infrastructure/service programs, and protected the pre-existing export industries. Even though the primary purpose of the MRSF is to provide a stabilizing mechanism, for revenue fluctuations caused by price/market variation within the minerals industry, it is equally important in terms of its secondary impact of dampening the "dutch disease" syndrome within Papua New Guinea which may be its greatest benefit to the nation in the long term.

11. Resource Rent Revenue Sharing and Sustainable Development

Achieving sustainable development from the utilization of a country’s mineral resources represents one of the major challenges, if not the major challenge facing industry, governments and local communities. The reality of mineral extraction is that all mines are finite in terms of mine life and only a certain amount of revenues, and associated resource rents, will be derived over the life of a mine. Therefore, within these constraints it is essential that all parties plan for sustainability. In undertaking such planning it must be remembered, with only rare exceptions, that the economic, social, cultural and environmental activities that existed when the mine was operational, no matter how desirable they may have seemed/been, cannot/will not be perpetuated at or near the same level once the mine is closed and rehabilitated. Therefore, long before the mining activity is scheduled to cease, it is essential that all parties begin “planning for closure” – indeed this process should begin as soon as a mine is contemplated in order to mitigate many of the deleterious impacts of mining. It is beyond the scope of this paper to deal with all, or even a significant portion, of the issues related to achieving sustainable development from mining activities but a number of issues, that are specific to PICs that must be addressed are:

1. Government, industry and island stakeholders must come to a common definition and understanding with respect to what sustainable development, resulting from mineral development, means and how it is to be accomplished. The funding of sustainable development programs represents the single greatest challenge to achieving the goals of a program. In a recent survey of corporate mining executives 80% of the

respondents cited the "ability to link sustainable development to financial success" as the major problem to be addressed (Mining Journal, 1999).

2. Sustainable development programs should be developed from the "ground up" and not "top down" if they are to be successful.
3. Sustainable development programs should be fully funded and operational at the point that the mine has reached 75% of its anticipated mine life. Under no circumstances should funding occur in the latter quarter of a mine's life.
4. The development and implementation of programs that truly meet the objectives of achieving sustainability is extremely difficult and must recognize the following:
    a. Human resource development should be the major priority of all sustainability programs and should provide for significant components of social welfare (health, education) particularly for children, women and minorities.
    b. Sustainable programs will require a shift from an emphasis on the exploitation of non-renewable resources to the exploitation of renewable resources, e.g. fisheries, forestry, agriculture.
    c. Sustainable development programs will, in the majority of cases, not perpetuate the level of economic well being that was experienced during the life of the mine. Therefore there is a major need to "manage expectations" throughout the life of the mine.
5. Economic programs, that rely on the resources of industry and/or government, such as foundations or various stock/bond/investment activities, must be developed in such a way to allow for changes in the global and national economy if they are to be relevant and successful.
6. The local management of sustainable development programs is essential to their success, therefore there is a need to ensure that that the necessary management skills are developed locally in order to ensure the success of the programs in the future.
7. Government, industry and local stakeholders must agree to an acceptable exit strategy for the closing of the mining operation and ensure that this plan is rigorously adhered to during the life of the mine.

Achieving sustainability is the newest and perhaps the most difficult problem facing PIC governments, industry and local stakeholders. Available experience shows that resource rent revenue sharing throughout the life of a mine is critical if those most affected are to effectively participate in the development process. Perhaps most importantly, only through the involvement of the local communities, with access to fiscal resources, can sustainable development be achieved.

12. Summary and Conclusions

The issues of resource rent revenue sharing within resource-rich nations Pacific Island countries pose numerous problems as well as opportunities. The major problems that arise from resource-rent revenue sharing within the PICs are comparatively new, poorly understood and are inadequately addressed by government and civil society institutions and are summarized in the following:

Resource Rents	Structural Problems
Resources, and associated rents, are unevenly distributed geographically	Administrative capacity and personnel are unevenly distributed with in the LGUs.
Commodity prices are variable and as a result, associated rents fluctuate, making planning difficult.	Integration of national planning objectives with local objectives is difficult because of priorities and timing
Resource rents accrue opposite the times of greatest need and real returns may be delayed for 3-7 years.	Fiscal receipts at the LGU level are inadequate for meeting the needs of large-scale resource development projects.
Resource rents are finite requiring efficient long-term planning for sustainable development	Decreased national receipts require that the LGUs assume a larger burden for development.

The experiences of resource-rich PICs, in particular those of Papua New Guinea, show the following problems:

1. The move from a highly centralized government and fiscal policy to a policy of resource rent revenue sharing is often precipitated by and/or results in social upheaval and dramatic changes in government.

2. The creation of a competent and experienced bureaucracy in the LGUs is both difficult and time consuming, however, is the cornerstone for the success of fiscal decentralization.

3. Legislative allocation of “resource rent revenue sharing on a strict percentage basis" is largely “ad hoc” and may or may not reflect actual impact and need by the LGUs with respect to resource development.

As a result of the above, it is proposed that resource-rich PICs undertaking programs of resource rent revenue sharing should, as a matter of national policy, adopt and undertake the following national policy initiatives

1. Government should enter into a national planning program, with inputs from the LGUs and NGOs, to define the nature and timing of resource rent revenue sharing activities. Alternative models for action should be developed which meet the unique needs of the individual provinces/regions.

2. National and provincial agencies should assess actual and potential resource development options for individual provinces and establish, to the extent possible, the time frame for such developments and anticipated revenues.

3. National government, with inputs from LGUs, industry and NGOs, should define the economic, social, cultural and environmental impacts of ongoing and planned resource development projects at the local to provincial level.

4. For those Provinces anticipated to be impacted by resource developments, initial planning for the development of necessary infrastructure for the resource development should be phased with the needs for overall infrastructure development at a national and regional level.

6. Government social programs should continue at present levels for all provinces, however, impacted/to be impacted provinces should receive supplemental IRA funding to prepare the local communities for participation in the development in order to achieve sustainable development.

7. The national government should develop and implement training programs to ensure that they are able to undertake the additional management and planning activities that will arise as a result of resource rent revenue sharing

8. The national government should prepare an action program for overall development that reduces, to the extent possible, the inequalities that will arise as a result of resource rent revenue sharing between resource-rich and resource-poor provinces.

9. Planning at all phases of government should emphasize sustainable and socially responsible resource development that has as a central theme the understanding that virtually no resources are truly renewable and virtually all will be depleted over time, therefore, it is essential to plan for sustainability.

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