Research Report on the Japan Social Development Fund Project on Artisanal and Small-Scale Mining in Papua New Guinea

Overview
This report aims to describe and evaluate the outputs and outcomes of a recent project funded by the Japan Social Development Fund (JSDF) and implemented by the Wau Ecology Institute (WEI) to assist artisanal and small-scale mining (ASM) communities in Papua New Guinea (PNG). This is done in the context of a broader initiative funded by CASM and administered by the Resource Management in Asia-Pacific Programme (RMAP) of the Australian National University (ANU) that seeks to document analogous initiatives throughout the Asia-Pacific region to serve as a guide to the development of better policy and practice in its different jurisdictions.

Introduction
The report begins with an overview of artisanal and small-scale mining in the Wau-Bulolo District of Morobe Province and wider Papua New Guinea. Although its main emphasis is on the current livelihoods of PNG ASM communities, the review includes historical information that is necessary to understand the sector’s present configuration in the Wau-Bulolo District and beyond. The report then discusses some of the challenges and opportunities offered by ASM in relation to the Millennium Development Goals (MDG) contained in the United Nations Millennium Declaration (2000) of which Papua New Guinea is a signatory.

Due to the limited resources and time available for this study I was unable to interview all consultants involved in the PNGJSDF Project. I was equally prevented from visiting all parts of the Wau-Bulolo District and the other provinces that benefited from PNGJSDF training. The findings presented here are based primarily on first-hand observations and interviews conducted in Port Moresby, Lae, and the Wau and Bulolo LLGs of the Wau-Bulolo District in September 2007.

Those interviewed included PNGJSDF staff and consult-

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ants, representatives of the PNG Government, Wau Ecology Institute, World Bank, Wau-Bulolo Gold Miners Association, and several members of the mining-impacted communities touched by the Project.

The report also draws on doctoral research I carried out on artisanal and small-scale gold mining in the Wau-Bulolo District between 2004 and 2005, and on an extensive review of published and unpublished literature on PNGJSDF and the history and present status of ASM in Papua New Guinea.

My description and assessment of the outputs and outcomes of the PNGJSDF Project are based on what had been achieved up to September 2007 when several Project components were still ongoing. They are also constrained by a lack of accurate baseline data on all aspects of ASM activities in the Wau-Bulolo District and wider PNG; and by the fact that the outcomes of certain Project components will take some time to become fully apparent.

Overview of ASM Gold Mining in PNG

The National Context

Artisanal and small-scale gold mining has been a feature of Papua New Guinea for nearly 120 years (Afenya 1995; Banks 2001; Hancock 1994; Lole 2005; Susapu and Crispin 2001). For much of the colonial era the industry was dominated by Europeans who employed Papua New Guineans as mining labourers, carriers, and in a variety of other ancillary roles. In 1949 the first nationals were reported to work independently of Europeans in the Wanion River of Morobe Province (Lole 2005; Stewart and Blowers 1985; Susapu and Crispin 2001). From the late 1960s most expatriates abandoned their leases and growing numbers of nationals started their own operations (Afenya 1995; Lole 2005). This process led to a gradual increase in the overall number of artisanal and small-scale miners and a concurrent drop in the level of mechanisation (Lole 2005).

By the 1980s the national ASM population had reached 3,500-5,000 and was estimated to produce 8,000 ounces of gold per annum (Gibungae 1988; Lole 2005). Since then the sector has continued to grow and is now believed to involve between 50,000 and 100,000 rural miners who operate in every province of Papua New Guinea, including the National Capital District (NCD) (Susapu and Crispin 2001; Crispin 2003, 2006). As an average of seven people are estimated to depend in some way on the industry for every directly involved miner (Susapu and Crispin 2001), a further 350,000-700,000 Papua New Guineans could also be deriving an indirect economic benefit from the ASM sector.

Of the 50,000-100,000 people directly involved in the industry, around 20% are believed to be women and 30% school age children under 16 years of age (Crispin 2003, 2006; Susapu and Crispin 2001). Approximately 85-90% are held to be artisanal miners who use simple panning dishes or sluice boxes without any mechanical aids. Another 9-10% are reputed to engage in semi-mechanised operations that make use of portable equipment like pontoon dredges, hydraulic sluice pumps, and sluice boxes.

Only 1% are believed to work in fully mechanised operations that employ earth-
moving equipment like bulldozers and excavators and ore-processing machinery like trommels and jigs (Crispin 2003; Lole 2005; Susapu and Crispin 2001).

Despite this low level of mechanisation, the PNG ASM sector is reported to yield at least 120,000 oz per annum (Crispin 2003). At an average 2007 gold price of US$ 674 per ounce\(^2\), this would be worth some 80,880,000 US dollars, which is equivalent to around 1.4% of the 2006 national GDP\(^3\).

The Wau-Bulolo District

The Wau-Bulolo District (WBD) of Morobe Province has a population of 77,232 and a land area of 9,278 square kilometres divided into the six Local Level Governments (LLG) of Wau, Bulolo, Watut, Buang, Mumeng and Garaina/Waria. Its topography is generally steep and mountainous with forested mountain peaks that can reach over 2,000 metres in height. However, this mountainous territory opens out into the Bulolo, Wau, Watut and Waria Valley floors, which have an average elevation of 800 to 1,000 metres above sea level.

With the exception of the Waria area, a network of roads links the various parts of the District to each other and Lae, the second largest city of PNG and a major industrial centre. Nevertheless, many of these roads, including that linking Wau and Bulolo, are subject to significant disruption by rain and flooding (Bulolo Open Electorate 2003).

The District’s Mining History

The first significant gold discovery within the WBD occurred at Koranga, near present day Wau, in 1922\(^4\). Five years later an even richer deposit was found in the nearby Edie Creek area of Mount Kaindi. This led to a


\(^4\) Before then a small number of miners are reported to have crossed the border between the Australian Territory of Papua and German New Guinea to illegally mine the section of the Waria River that runs in the then German area that is now the Wau-Bulolo District. These activities, however, remained sporadic, short lived, and confined in scope. The same can be said of other individual gold discoveries that are claimed by some to have occurred in other parts of the District before 1922 (See Burton 2001; Clune 1951; and Nelson 1976).
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gold rush which, in the decades to come, attracted unprecedented numbers of miners, entrepreneurs, and adventurers from every corner of the globe, as well as thousands of indentured labourers from all over New Guinea (Blowers 1983; Booth 1924; Clune 1951; Demaître 1936; Idriess 1933; Leahy 1994; Lowenstein 1982; O’Neill 1979; Sinclair 1998; Struben 1961; Susapu and Crispin 2001).

In the early 1930s began the large-scale development of the Bulolo Valley alluvial gold resources by Bulolo Gold Dredging (BGD, a subsidiary of the Canadian-based Placer Development Ltd). At around the same time large-scale hard rock mining was carried out in the Edie Creek area of Mount Kaindi by New Guinea Goldfields Ltd (NGG, a subsidiary of Russo-Asiatic Consolidated). Thanks to these larger companies the District was opened to air transportation and within a decade Wau and Bulolo grew into booming colonial enclaves. Furthermore, the District’s extractive industry provided the main stimulus for the growth of Salamaaua first and then Lae (Banks 2001; Booth 1924; Clune 1951; Demaître 1936; Healy 1967; Howard 1991; Idriess 1933; Lowenstein 1982; Sinclair 1998; Susapu and Crispin 2001).

At its peak in 1942 the annual production of gold from the “Morobe Goldfields” reached 260,000 oz (Hancock 1994). In that same year the District’s mining operations came to a halt due to the Japanese invasion of New Guinea, and although they were re-started soon after the end of the war they never managed to regain pre-WWII production levels (Hancock 1994; Healy 1967; Lowenstein 1982; Sinclair 1998).

Large Mining Operations Wind Down

In fact, after WWII BGD (which was the largest company in Bulolo) gradually closed its mining operations, bringing them to a complete halt in the mid-1960s. Similarly, NGG (the largest employer in Wau) wound down its operations in the Wau Valley and Mount Kaindi, which came to a complete halt in the 1990s (Lawrence 1994; Lowenstein 1982; Sinclair 1998). Meanwhile, from the 1950s the first national miners began to work independently of Europeans, and between then and the 1960s many applied for, and were granted, both old and new mining leases (Burton 2001; Lowenstein 1982; Susapu and Crispin 2001).

As expatriate miners began to leave in anticipation of independence and the larger companies scaled down their activities, hundreds of Finschaafen, Sepik, Highlander, Kunimaipa, and Goilala labourers were left. Unwilling or unable to return to their native villages, many of them settled in the District and started their own mining ventures.

As a result of these processes the District’s extractive landscape became progressively indigenised, and by 1976 nationals were responsible for around 80% of the annual alluvial gold production and 45% of the total yearly output of the Morobe Goldfields (Lowenstein 1982: 16; 137).

In the three decades since Independence increasing numbers of District residents continued to enter ASM.

In this they were joined by large numbers of migrants from many parts of the country. As a result the number of miners working in the Wau-Bulolo District grew very rapidly. For example, the Edie Creek population alone doubled between 1980 and 1990 and then tripled again in the following decade (Moretti 2006).

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WBD’s Economic Situation Today

Today the District’s economy depends on subsistence gardening and commercial activities like cash cropping, logging, trading, and mining (Bulolo Open Electorate 2003). The importance of the latter is expected to grow significantly with the medium-scale development of three gold deposits located at Hidden Valley, Hamata and Wafi by the South African mining company Harmony, the first of which is scheduled to reach full production in June 2009.

This said, ASM continues to make a very significant contribution to the regional economy and to be practiced by a very large number of District residents (Bulolo Open Electorate 2003; Lole 2005). For instance, Department of Mining (DoM) estimates indicate that up to 75% of the total Wau area population (including women and children) are involved in ASM at some time or other (Crispin 2006; Susapu and Crispin 2001). And in a survey conducted in the year 2000 Blowers (2000) estimated that in the Wau, Bulolo, and Watut areas alone ASM yields around 800 kilos of gold per year, which at the average gold price for 2007 would be worth over US$ 17,000,000.

As is also the case in other parts of the country, some Wau-Bulolo communities are full time miners who have almost completely abandoned subsistence activities like gardening, hunting, gathering, and the rearing of pigs and chickens (Blowers 2000; Moretti 2004-2005, 2006; Susapu and Crispin 2001). Nevertheless, even there people often engage in complementary activities like gold buying or trading alongside mining (Moretti 2004-2005, 2006).

Furthermore, as is the case throughout PNG, most District miners practice ASM on a part-time basis alongside other subsistence and commercial activities like trading, cash cropping, animal husbandry and subsistence gardening (Blowers 2000; Crispin 2006; Lole 2005). Some of these part-time miners mine only seasonally, either because of the availability of rainwater (too little and too much water impede mining), and/or because they mine only when they have particular cash needs, such as at the beginning of the school year when school fees are needed, or at Christmas and Easter when people need cash for Christian celebrations.

Others engage in part-time mining all-year round, with the exception of times fully dedicated to the harvesting of crops like coffee or copra (Blowers 2000; Crispin 2006; Lole 2005; Moretti 2004-2005; Susapu and Crispin 2001).

Simple Mining Methods Support Subsistence Lifestyle

As is again the case across Papua New Guinea, most local mining is carried out by simple means and is of a subsistence nature-by which is meant that the money earned through it is quickly spent on food, clothes, and other immediate necessities (Blowers 2000, Moretti 2004-2005). Nevertheless, over the years the District has had a fluctuating number of semi-mechanised and mechanised operations.

Some of them belonged to national miners who, having won huge fortunes from their workings, expanded and mechanised their operations and invested in housing and commercial properties, plantations, trade stores, and alternative businesses like coffee buying and the provision of transportation of goods and persons.

Almost invariably, however, a combination of poor finance and management skills, reliance on dishonest expatriate and national accountants and operation managers, and social pressure and family politics led to the demise of these mechanised operations and the alternative businesses they had sustained (Lole 2005; Moretti 2006). As a result, in 2007 only one mechanised operation was fully owned by a national miner.

By and large, most past and present mechanised operations within the Wau-Bulolo District were and remain joint ventures between expatriates and nationals, but only a handful were still active in 2007 (Department of Mining 1999c; Lole 2005; Moretti 2004-2005, 2006).


“... a combination of poor finance and management skills, reliance on dishonest expatriate and national accountants and operation managers, and social pressure and family politics led to the demise of these mechanised operations and the alternative businesses they had sustained...”

For further information visit the Artisanal and Small-scale Mining in Asia-Pacific Portal on http://www.asmasiapacific.org
Overview of Supply Chain

Most District miners sell their gold to village-based middlemen who buy relatively small amounts of gold for resale to bigger buyers in Wau, Bulolo, and Lae. Some of these larger buyers then sell gold on to Metals Refining Operations Ltd (MRO) in Port Moresby or to other exporters, but some hold their own export licences and sell directly to foreign markets (Blowers 2000; Moretti 2004-2005).

Nevertheless, if they find or accumulate larger amounts of gold the miners may travel to Wau, Bulolo, or Lae to sell their gold directly to larger buyers.

However, this is made dangerous by the very real risk of being robbed along the way. Furthermore, they occasionally overestimate the price paid in these urban centres and underestimate the travel and living costs they would incur to reach and stay in them, with the result that they end up achieving a lower return than they would have selling to rural buyers (Moretti 2004-2005). Since the deregulation of the gold market in the late 1980 there has been an explosion in the number of gold buyers operating within the District (Blowers 2000; Moretti 2004-2005).

Under the old system only banks and registered mining companies, miners, leaseholders, and tributers7 were allowed to buy and sell gold. Moreover, the miners had to pay a 10% withholding tax and a 2.5% royalty on the gold they produced. By contrast, today these taxes are no longer paid and anyone can legally sell and buy gold within PNG, although a licence from the Bank of Papua New Guinea (BPNG) is still required to export it (Afenya 1994; Crispin 2003; Department of Mining 2001d; Lole 2005; Susapu and Crispin 2001). Furthermore, gold acquired through illegal mining and pilfered by workers and tributers is now much easier to sell, with the result that more and more people are mining illegally and that registered leaseholders and customary landowners find it harder to control their mineral resources (Lole 2005; Moretti 2004-2005, 2006).

And while deregulation has enabled more rural people, including large numbers of miners, to enter the gold buying business, the fiercer competition between them and the fact that many lack the necessary business skills, the capacity to judge the value of gold samples originating from areas with vastly different levels of gold purity8, and sufficient knowledge of the national and global gold market, few rural buyers are able to run profitable and sustainable businesses.

1992 Mining Act Gives Greater Recognition to Customary Landowners

In order to appreciate the current status of artisanal and small-scale mining in the Wau-Bulolo District, a final mention must be made of some of the effects of the introduction of the new Mining Act in 1992. This new Act gave greater recognition to cus-

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7 A “tributer” is the holder of a “tribute agreement” with a company or other leaseholder whereby s/he is allowed to mine that company’s or other leaseholder’s tenement provided that the holder shall receive a portion or percentage of the minerals won by the tribute holder (see Moretti 2006).

8 Even within the Wau-Bulolo District gold fineness varies from 55% to 90% (Blowers 1983; Lowenstein 1982). To make matters worse, sometimes miners mix other metals in with gold to increase the weight of their parcels or try (knowingly or not) to sell pyrite or brass off as gold (Department of Mining 2001d).
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tomary landowners, allowing them to conduct non-mechanised alluvial mining on their land without the need to obtain a registered lease. In addition, it created a type of lease - the Alluvial Mining Lease (AML) - which has a maximum size of five hectares and is restricted to customary landowners.

Similarly, it prescribed that larger Mining Leases (ML) used for alluvial mining must be owned by nationals or in case of a joint venture, that nationals should own 51% of the operation. This was done to facilitate legal landowner participation.

However, the Act created problems in the WBD because it demanded that those who held leases under the repealed Act should reregister them in accordance with the new law.

However, not all local miners were able or willing to do so, with the result that some Wau-Bulolo leases have been officially forfeited and are now being worked illegally (Lole 2005). Moreover, the new Act did not recognise tributers engaged by large companies like NGG and other smaller leaseholders under the repealed Act. This meant that many of the miners operating in the Wau-Bulolo District, who were tributers and non-customary landowners, lost their recognised status and were forced to mine illegally (Lole 2005).

The new Act also stated that registered leaseholders must pay compensation to customary landowners or, if the land they mine is still disputed by different claimants, that they should pay this compensation in an account to be held in trust until the “legitimate” landowners are individuated (Afenya 1995). However, in the WBD many “non-landowner” miners have been working their leases and tributes for many years, decades, or even generations.

As a result, they regard themselves as legitimate landowners and refuse to pay compensation to the “legally recognised” landowners.

In turn, the latter are unhappy about not having received compensation for the exploitation of “their land” and believe that the leases given to others under the repealed Act should now be returned to them. As a result, in 2005 about four leases were forcefully taken over by “customary landowners” (Lole 2005), and unless some resolution is found it is likely that similar conflicts and forced repossession will persist and even intensify in coming years.
PNG ASM and the Millennium Development Goals (MDG): Challenges and Opportunities

A Potential Motor for Rural Development

The artisanal and small-scale mining of alluvial and hard rock gold is a legally recognised industry that makes an important contribution to the PNG GDP and to national and provincial government revenues through the GST paid by the miners and the businesses they sustain (Banks 2001; Lole 2005; Susapu and Crispin 2001). In a country where 87% of citizens live in villages or isolated rural communities, 80% derive a livelihood from subsistence agriculture, and rural cash-earning opportunities are often limited, ASM is also an important motor for rural development. For instance, in places like Wau, Kainantu, and Maprik ASM sustains a much higher number of formal and informal businesses and a volume of trade far superior to what is typical of comparable rural locations (Lole 2005; Susapu and Crispin 2001).

As the number of people directly engaged in it are much higher than those directly employed in large- and medium-scale mining (LSM and MSM) and are dispersed throughout Papua New Guinea, the economic benefits of ASM are also more widely distributed than those generated by larger scale mining, which tend to be confined to those living near to each project area (Banks 2001; Lole 2005). Furthermore, ASM communities are more self-reliant and less dependent on the benefits generated and controlled by outside developers than those involved in MSM and LSM projects.

Promoting ASM could therefore increase the income and self-reliance of rural communities and contribute towards the achievement of the first Millennium Development Goal (MDG1) to “eradicate extreme poverty and hunger” (See Box on page 9).

Indeed, informal observations by the Department of Mining at a time when the kina was worth US$ 0.50 and the price of gold was much lower than now placed the average earnings of PNG artisanal and small-scale miners at 3,000–6,600 kina per annum. This was already much higher than the then average annual income for more than two thirds of PNG provinces, which the ADB estimated to cluster around 461 kina (Crispin 2001, 2003; Lole 2005), and well above the international poverty line of US$ 1 per day.

Moreover, as it can be conducted alongside other subsistence and commercial activities like gardening, cash-cropping, animal husbandry, and trade, expanded participation in the ASM sector does not necessarily come at the cost of loss of subsistence food production or complete dependence on a single form of livelihood (Afeny 1995; Blowers 1983; Crispin 2006; Lole 2005; Stewart and Blowers 1985; Susapu and Crispin 2001).

And finally, with the introduction of the user pay policy by the Government of Papua New Guinea (GoPNG) in 1996 ASM represents not only a way of expanding the rural cash economy and increasing the consumption of market goods by rural communities, but also a means of accessing essential services like education and health care (Lole 2005).

In turn, this has implications for MDG 2, 4, 5, and 6 (See Box on page 9). Of course, the increased capacity to access these services remains dependent on their availability within reasonable distance of ASM communities and on the miners’ willingness to invest in them. Thus, in relation to education, evidence from some parts of the country suggests that the possibility to earn “quick cash” through mining may act as a disincentive for children to attend school in a country where 87% of citizens live in villages or isolated rural communities, 80% derive a livelihood from subsistence agriculture, and rural cash-earning opportunities are often limited, ASM is also an important motor for rural development. For instance, in places like Wau, Kainantu, and Maprik ASM sustains a much higher number of formal and informal businesses and a volume of trade far superior to what is typical of comparable rural locations.”

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9 This review of the opportunities and challenges ASM presents vis-à-vis the Millennium Development Goals is by no means exhaustive. Rather, its focus is on those that relate directly to the interventions conducted under the Japan Social Development Fund Project on Artisanal and Small-scale Mining in Papua New Guinea.

10 As will be seen in what follows, this does not mean complete self-reliance. On the contrary, many PNG mechanised small-mining operations are the result of joint ventures between national landowners and outsiders with access to greater capital, machinery and technical know-how. Nevertheless, ASM can also be carried out by very simple non-mechanised and semi-mechanised means that require little or dependence from outsider financiers. Indeed, most current ASM operations in Papua New Guinea fall squarely in this category. What is more, with greater training in finance, management, and mining principles and increased access to micro-financing PNG miners would have a greater chance to start and run their own mechanised operations and to participate in joint ventures on more equal terms. As is discussed in what follows, this is precisely one of the aims of several recent donor initiatives like the Japan Social Development Fund Project on Artisanal and Small-scale Mining in Papua New Guinea.
The Millennium Development Goals

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world’s main development challenges:

- **MDG 1**: Eradicate extreme poverty and hunger
- **MDG 2**: Achieve universal primary education
- **MDG 3**: Promote gender equality and empower women
- **MDG 4**: Reduce child mortality
- **MDG 5**: Improve maternal health
- **MDG 6**: Combat HIV/AIDS, malaria and other diseases
- **MDG 7**: Ensure environmental sustainability
- **MDG 8**: Develop a Global Partnership for Development

The MDGs are drawn from the actions and targets contained in the Millennium Declaration that was adopted by 189 nations and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000. The MDGs:

- synthesise, in a single package, many of the most important commitments made separately at the international conferences and summits of the 1990s;
- recognise explicitly the interdependence between growth, poverty reduction and sustainable development;
- acknowledge that development rests on the foundations of democratic governance, the rule of law, respect for human rights and peace and security;
- are based on time-bound and measurable targets accompanied by indicators for monitoring progress; and
- bring together, in the eighth Goal, the responsibilities of developing countries with those of developed countries, founded on a global partnership endorsed at the International Conference on Financing for Development in Monterrey, Mexico in March 2002, and again at the Johannesburg World Summit on Sustainable Development in August 2002.


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and for parents to keep their children in education (Moretti 2004-2005).

Nevertheless, in areas like the Wau-Bulolo District both parents and students engage in mining as a means of paying school fees, which means that ASM can also serve to enable greater participation in education (Crispin 2006; Lole 2005; Moretti 2004-2005; Susapu and Crispin 2001).

In relation to health, ASM can also have substantial negative impacts on the health of those who engage in or are impacted by it, including pregnant women and children. Indeed, as I shall discuss below the mitigation of these impacts is an important target of many recent GoPNG and donor-funded initiatives, including the Japan Social Development Fund Project on Artisanal and Small-scale Mining in Papua New Guinea (PNGSDF).

“... the possibility to earn “quick cash” through mining may act as a disincentive for children to attend school and for parents to keep their children in education.”
MDGs - Efficiency and Productivity Challenges

Papuans Resourceful in Pursuit of Gold Mining

Thus, if ASM offers great potential for the rural development of PNG it also poses significant economic, environmental, and social challenges. To begin with, around 90% of PNG artisanal and small-scale miners rely only on simple, non-mechanical tools and techniques. On the one hand, this confirms that artisanal mining can be easily picked up by rural grassroots who lack the capital to invest in more complex operations.

What is more, it testifies to the inventiveness and resourcefulness that Papuan New Guineans have demonstrated in their pursuit of gold mining. For example, they have learnt to manufacture tools like crowbars, dolly pots, and sluice boxes from wood and scrap metal and to use leaves and old pieces of string bags and cloth as sluice box mats (Afenya 1995; Hancock 1994; Lole 2005; Susapu and Crispin 2001).

In some areas they even use ground sluice boxes, which are essentially trenches of around the same width of a conventional sluice box that are lined with leaves and other improvised materials for matting. The main reason for this is that these “boxes” cannot be stolen and do not need to be transported back and forth between the settlements and the mines (Afenya 1995; Blowers 1988; Lole 2005).

Furthermore, they have learnt to construct short races and dams to supply their workings with gravity-fed water to use in sluicing (Moretti 2004-2005), and to make use of simple means like fires and boiling water to heat and break large boulders that cover gold deposits (Susapu and Crispin 2001).

Papuans Need to Improve Extractive Practices

If they have proven to be inventive, resourceful, and adaptable, PNG miners are also known to engage in ineffective or less effective extractive practices. For instance, many use homemade sluice boxes that are too short for effective gold recovery. Similarly, they often fail to use riffles or employ boxes with only one or two riffles and no mat. And even when they do make use of home-built or store-bought riffles, these are not always properly constructed and/or correctly placed, which again compromises gold recovery rates.

Effective gold recovery is also compromised by the fact that they do not always wet and mix gravels correctly and that they do not clean boxes with sufficient frequency and care (Afenya 1995; Blowers 1983; Crispin 2003; Hancock 1994; Susapu and Crispin 2001). Similarly, when they employ sluice boxes they commonly fail to use water with sufficient velocity levels to move anything but silt and very fine sands (Afenya 1995; Blowers 1983; Hancock 1994; Stewart and Blowers 1985; Susapu and Crispin 2001).

On the one hand, this has the advantage of avoiding the costly and time-consuming construction of complex water supplying systems. Moreover, it forces the miners to manually remove all larger stones that accumulate in the box, which arguably forces them to check them more carefully and thus enhances the recovery rate of gold-bearing ones (Blowers 1983; Hancock 1994).

On the other hand, though, the miners do not always check all these stones with due care (Moretti 2004-2005). What is more, the use of low amounts of water at limited velocity reduces significantly the volume of gravel that they can process in a day-and thus also the amounts of gold they can produce (Blowers 1983).

In other words, all this means that in order to maximise the economic benefits and efficiency of ASM PNG miners should be encouraged to make some changes to their existing mining practices. Indeed, even with slight and relatively inexpensive improvements to the non-mechanical tools and the manual techniques they use gold recovery could increase significantly.

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adopted in the more remote areas of Papua New Guinea and by those who lack the capital and expertise required to run semi-mechanised and fully mechanised operations. Furthermore, these same characteristics allow them to be easily (re)started or put on hold in response to changes in gold prices and make them more suitable to seasonal and part-time mining (Afeyna 1995; Blowers 1983; Hancock 1994; Stewart and Blowers 1985).

Having said this, non-mechanised ASM techniques have significant disadvantages. Indeed, even at their most effective they require high levels of very demanding physical labour for what are relatively low throughputs and recovery levels.

In turn, this means that they can only be employed on deposits with higher gold grades.

Moreover, their comparatively low recovery rate and their inability to reach deep deposits means that non-mechanised ASM operations often leave behind deposits that are uneconomical for further mining.

By contrast, semi and fully mechanised operations rely on imported equipment that is costly to buy and maintain, and which cannot be easily transported to the most remote parts of the country. When improperly managed, they also hold greater potential for environmental degradation than non-mechanised operations. Furthermore, as they require fewer labourers than non-mechanised ones, an increased mechanisation of the PNG ASM industry would reduce the numbers of those who derive a direct benefit from it.

On the other hand, even a modest rise in the mechanisation levels of the ASM sector would allow for the exploitation of lower grade deposits, for a faster and more efficient development of all mineral resources, and for a significant increase in its annual outputs, which in turn would augment its benefits to the national economy (Afeyna 1995; Blowers 1983; Gibungae 1988; Hancock 1994; Lole 2005; Stewart and Blowers 1985; Susapu and Crispin 2001).

A first barrier to the development of more mechanised operations is the unwillingness of commercial lenders to provide financing to PNG miners and the reluctance of outside financiers to form joint ventures with them. The reasons for this are many and complex, and here I shall only mention a few that are directly relevant to some of the interventions made by PNG JSDF.

The first is the volatility of gold prices and the difficulty of estimating the value of local deposits so as to minimise the risks of investing and borrowing to develop them. Another is that many grassroots miners are unfamiliar with the mechanised tools and techniques that are now available and with their relative advantages and disadvantages.

The third is that many also lack the formal finance, business, and technical skills that would increase their chances of accessing what little financing is available to them, running profitable and sustainable mining ventures and spin-off businesses, and appreciating the risks and costs involved in joint mechanised ventures.

All of these factors are also important in understanding why, even when they do earn enough money from simple operations to reinvest in more sophisticated mining equipment and alternative businesses, most are unable to make either profitable or sustainable.

11 Once again, I must stress that this is only a very partial review of the complex difficulties PNG miners face in accessing capital, running sustainable mining and spin-off businesses, and forming and maintaining durable and mutually beneficial joint-ventures with outsiders. Other important factors include the uncertainty of tenure over mining land tied to the omnipresent potential for land disputes between different miners and customary land-owners (Hancock 1995; Lole 2005; Moretti 2004-2005); the isolation of many PNG ASM areas which makes repairs costly (Afeyna 1995; Hancock 1994; Lole 2005); the different interests that national and expatriates have for entering mining joint-ventures (Moretti 2004-2005); their mutual (mis)understandings of one another’s behaviour, motives, and position within joint-ventures (Moretti 2004-2005); their different views on what business should do and be for (Moretti 2004-2005); and the values and social obligations that guide PNG miners and business operators (Moretti 2004-2005).
Mercury Use Threatens Human Health and Destabilizes Environment

Another bottleneck in the development of more efficient and sustainable ASM practices is the miners’ lack of awareness of the health and safety and environmental risks associated with their activities and the lack of simple and easily accessible guidelines on how to reduce them. For example, mercury is widely used in the WBDO and many other parts of the country because amalgamation is an efficient and relatively inexpensive way of extracting fine gold particles from the fine black sands obtained from the panning and sluicing operations that are most common in PNG ASM. As a matter of fact, in 1994 WEI and Papua New Guinea University of Technology (PNG UNITECH) staff estimated that the PNG ASM industry was already using a minimum of 20-30 tonnes of mercury per year (Afena 1995; Crispin 2003; Lole 2005; Susapu and Crispin 2001).

Indeed, an informal survey of wholesale records conducted by the Department of Mining in 1999 indicated that around four tonnes of mercury are used each year by PNG artisanal and small-scale miners, but this figure could have actually been much higher because it did not take into account unrecorded and illegal mercury sales (Crispin 2003; Susapu and Crispin 2001). Given that mercury is toxic in all its forms (i.e. liquid, vapour, inorganic, and organic), the aforementioned practices expose the miners to the risk of mercury poisoning by absorption through skin contact, inhalation, and the consumption of contaminated foods and water. In turn, this can result in vomiting, gastroenteritis, complaints of the kidney and urinary tract, ulceration of the gums, shaking, and extreme light sensitivity.

Mercury and urinary tract, ulceration of the gums, shaking, and extreme light sensitivity.

If absorbed over a long period of time, mercury can also cause kidney ulceration, speech disturbances, lack of concentration, and damage to the central nervous system. As a result, the unsafe use of mercury in PNG ASM could be said to have implications for the sixth MDG of combating and prevent-
Continued from page 12 - MDGs - Environmental Health and Safety Issues

ing diseases. Moreover, as mercury poisoning is particularly dangerous to developing foetuses and children, it could also impact on MDGs 4 and 5 of safeguarding and improving child and maternal health (Afenya 1995; Blowers 1988; Department of Mining 1999).

Finally, the direct release of mercury into land and water and of mercury vapours and fumes into the atmosphere - from which they return to the ground and river systems - has again implications for MDGs 4, 5, and 6, and for MDG 7, which calls for the achievement of greater environmental sustainability. Indeed, mercury can persist for a very long time in land and water. For example, it is believed that poodles of mercury and naturally formed lumps of mercury and gold are still commonly found in areas like Bougainville and the Wau-Bulolo District as a result of mining conducted many decades ago (Crispin 2003; Susapu and Crispin 2001).

Once released into the environment mercury can contaminate water that is then consumed by local communities. Moreover, it can eventually enter the food chain in the form of methyl mercury, which is extremely toxic and particularly dangerous for children, pregnant women, and developing foetuses. The risk of such contamination is increased by the fact that, in some parts of the country, miners are reported to consume fish caught directly in old mining ponds and other bodies of water polluted by mercury used in mining (Afenya 1995; Crispin 2003; Department of Mining 1999).

Other Negative Environmental Impacts Resulting from ASM Operations

Mercury pollution is not the only environmental and health and safety issue associated with PNG ASM. As well as mishandling mercury, the miners clear sizeable tracts of vegetation to dig for mineral-bearing ore, thus removing fertile topsoil, leaving behind exposed rocks and tailings, and increasing the effects of land erosion. Furthermore, they often dig and burrow into mountainsides and unconsolidated riverbanks, thus compromising ground stability and causing landslides and the collapse of banks, adits and tunnels.

These problems are accentuated by the fact that they seldom build benches, embankments, and drainage channels to slow down erosion and protect themselves, their properties, and the lives and properties of those who work and live beneath or above their workings from landslides and falling rocks and debris.

Moreover, they commonly fail to rehabilitate the lands they mine through the proper disposal of tailings and waste and revegetation.

Similarly, they do not cover or drain old trenches, holes, and water dams, which then become breeding grounds for malaria-spreading mosquitoes.

When mining alluvials, the miners dig around the roots of large trees that stand along gold bearing riverbanks, thus leading to their collapse. In turn, this accelerates erosion and creates danger from logs in rivers for those working lower down. In addition, alluvial mining can compromise riverbeds and riverbanks and cause flooding and damage to other workings, gardens, forests, residential areas, and roads and other such public assets.

Furthermore, the diversion of rivers and creeks as a result of, or in order to undertake, mining activities can deprive the miners and neighbouring communities of water sources, compromise the availability of

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fresh water fisheries, and cause further erosion and land degradation.

Although ASM activities can pump heavy sediment loads into local river systems, thus compromising water sources and fisheries and increasing the risk of flooding, few miners endeavour to address this through the use of settling ponds (Afenya 1995; Crispin 2003; Department of Mining 2001a, 2001b; Lole 2005; Moretti 2004-2005; Susapu and Crispin 2001).

Several Mining-related Fatalities Reported

In sum, the aforementioned mining practices pose a direct occupational risk to the miners themselves. As a result, several mining-related fatalities are reported in PNG every year, with four to five being reported annually in the WBD alone. And if my fieldwork experience is anything to go by, many more accidents occur than are officially reported to the relevant authorities (Crispin 2003; Department of Mining 2001b; Krimbu 2005; Lole 2005; Susapu and Crispin 2001).

But in addition to this, the mining and social practices and the living conditions of many mining communities have implications for the Millennium Development Goals of promoting environmental sustainability (including ensuring access to clean drinking water) (MDG7), and combating the spread of diseases like malaria, diarrhoea, HIV/AIDS and others (MDG6).

This is because even though PNG has a relative abundance of water, many miners depend for their water needs on streams and springs that can be easily contaminated by mining as well as by pollution from animals and the communities themselves, particularly as many lack efficient sanitation. Moreover, as mentioned above unfilled and undrained mining ponds, trenches, and holes can become breeding grounds for mosquitoes, thus facilitating the spread of malaria and other mosquito-borne diseases.

Furthermore, in many ASM centres prostitution appears to be common. This was indeed the case during the Mount Kare gold rush (Clark 1993; Wardlow 2004) and in the Wau-Bulolo District ..., where miners have sex with prostitutes both in the District itself and in the city of Lae, to which they used to travel after a sizeable gold find (Moretti 2004-2005). In turn, this suggests that artisanal and small-mining communities may be at a comparatively higher risk from HIV/AIDS and other sexually transmitted diseases, and from diseases like tuberculosis and pneumonia, which in PNG are frequently associated with HIV/AIDS (United Nations in Papua New Guinea 2004).

Moreover, as lack of access to clean water, unhygienic living conditions, and the prevalence of diseases like malaria and diarrhoea can impact particularly negatively on mothers and children, the aforementioned issues have implications for the Millennium Development Goals of reducing child mortality (MDG4) and improving maternal health (MDG5).

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Gender Issues in ASM and ASM-impacted Communities

Gender Imbalance in ASM Communities

Another major challenge posed by PNG ASM relates to the third Millennium Development Goal of promoting gender equality and empowering women. As seen above, current estimates suggest that around 20% of PNG artisanal and small-scale miners are women and 50% men\(^{12}\). At least in part, this lower level of female participation is due to the women’s own preference to engage in other kinds of productive activities.

Nevertheless, when they do want to mine women are often prevented from doing so by competing responsibilities like child

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\(^{12}\) I have not been able to find any statistics regarding the gender profile of the 30% of ASM miners who are estimated to be school children. My own observations in the Edie Creek area of the Wau-Bulolo District suggest that most of them would be boys rather than girls. However, I took no accurate records of this and, even if I had, they would not necessarily reflect the wider PNG picture. For this reason, I will limit myself to a discussion of the different levels of participation between adult men and women.
rearing, subsistence gardening, and other domestic duties. For this same reason, when they do mine they are often forced to take their children to the mines, where they are exposed to many of the risks reviewed above (Aviong 2005; Crispin 2006; Moretti 2006).

Women Excluded from Participating in ASM

Another important reason for the lower female participation in ASM is that (like most other men around the world) PNG men tend to view mining as an activity unsuited to women and try to discourage them from taking part in it, and particularly in the more lucrative mining of hard-rock deposits. As a result, when women work in the mines they tend to do so in association with, and under the control of, their husbands and/or other male relations.

Furthermore, they are often prevented from engaging in mining proper and in the processing of gold bearing gravels, being confined instead to ancillary roles such as transporting dug materials to preferred sites for panning and sluicing and final separation of gold. In turn, this means that they are often unable to retain control over the gold they mine and to gain a fair share of their husbands’ and male relations’ gold earnings for the running of households and alternative businesses like small trading.

The exclusion of women from ASM and their inability to fully benefit from their mining labours are also reflected in, and linked to, their lack of ownership over mining land. Indeed, for a variety of reasons that I have examined elsewhere (see Moretti 2006), very few PNG women own registered mining leases or have control over customary land that could be used in non-mechanised alluvial mining (Aviong 2005; Crispin 2006; Krimbu 2005; Moretti 2004-2005, 2006; Susapu and Crispin 2001).

There is evidence, however, to suggest that greater freedom to engage in ASM, greater control over the fruits of their mining labour, and increased ownership over mining land can be very beneficial to women. In particular, it can make them less dependent on their partners and male relations for the cash needed to buy food, clothes, and other daily necessities and to pay for essential services like healthcare and education for themselves and their families. Moreover, it can enable them to enter alternative businesses and contribute to the socio-economic exchanges of their communities, thus giving them a degree of prominence and agency that is often attainable by men alone (Moretti 2006; Wardlow 2006: 45).

Women in Mining Communities Face other Serious Challenges

As well as barriers to equal participation in ASM, women in mining communities face a range of other serious challenges. For instance, the aforementioned lack of access to clean water characteristic of many ASM communities is particularly harsh for women because they are the ones who have to walk a long way to fetch cooking and drinking water as well as to wash clothes and cooking implements.

In areas where mining is carried out full-time or even part-time for most of the year greater male involvement in mining means that women are left to carry out by themselves duties like felling trees or clearing garden undergrowth that were traditionally undertaken by men or in association with men. In turn, as they are still expected to carry out all those roles that traditionally pertained to their gender, the workload of these women increases considerably as a result of mining (Krimbu 2005; Moretti 2004-2005, 2006).

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The Department of Mining’s Involvement in PNG ASM

Constraints to the Department of Mining’s Institutional Capacity to Monitor, Regulate, and Promote PNG ASM

A final bottleneck in the more equitable and sustainable development of the PNG ASM sector is the National Government’s inability to provide sufficient resources to this task. As demonstrated by the inclusion of specific ASM statements and policies in its Five Year Development Plan for 1989-1993 and Medium Term Development Strategy for 1997-2002, the Government of Papua New Guinea (GoPNG) has long recognised the positive role ASM can play for rural development and the national economy (Afenya 1995; Lole 2005). Nevertheless, this realisation has not translated into adequate and sustained investment in the promotion and regulation of this sector (Crispin 2003).

As a result, the ASM branch of the Department of Mining (DoM) has been downsized over the years, with no new staff being recruited and offices closing down in Kainantu and Maprik and with facilities such as an assay laboratory closing down. This made DoM unable to collect accurate and up to date baseline data on the nationwide number and distribution of artisanal and small-scale miners, the nature and positive and negative implications of their mining techniques and living conditions, and the amount of gold that they produce each year. In turn, this severely hampered the Department’s capacity for networking, planning, and intervention and regulation (Lole 2005).

Moreover, reduced levels of staffing compromised its capacity to regulate the industry, provide technical support to the miners through the provision of services like assaying, surveying, and financing, and through awareness and educational outreach programmes. These shortcomings were aggravated by the fact that no active organisation existed to represent the interests of the miners, lobby GoPNG and other stakeholders on their behalf, and act as a partner in, and facilitator for, initiatives aimed at assisting the sector (Susapu and Crispin 2001).

The Department of Mining Seeks Assistance from International Donors

To compensate for the lack of resources made available by the National Government, the Department of Mining has sought the assistance of international donors (Lole 2005). Over the past eight years, this has resulted in a series of aid programmes for PNG ASM. The first was an AusAid initiative (1999-2001) that led, among others, to an informal survey of PNG ASM by DoM, studies on mercury use and its effects, outreach training programmes to enhance environmental awareness and reduce mercury impacts, and the production of a number of educational videos and booklets on ASM in English and Tok Pisin13 (Department of Mining 1999a, 1999b, 1999c, 2001a, 2001b, 2001c, 2001d. Also see Crispin 2003; Lole 2005; Susapu and Crispin 2001).

The second (which is still ongoing) involved the setting up of a micro-financing facility by the Asian Development Bank (ADB) in collaboration with GoPNG and the Bank of Papua New Guinea (BPNG). Known as the Wau Micro Bank, the Head Office and first branch of this bank were set up at Wau with the general aim to serve local grassroots but with a particular view to encourage local artisanal and small-scale miners to save and gain financing for their activities (Crispin 2003; Susapu and Crispin 2001).

Since then new branches have opened in Lae and in the ASM area of Wewak in East Sepik Province. The third initiative (also ongoing) consists of a 50,000,000 Euro Sysmin project that has a 6,800,000 Euro ASM component (Lole 2005).

This project will construct three training centres for artisanal and small-scale miners with the aim of increasing their technical knowledge and management skills. The first centre will open in Wau, the second (which will include a women’s centre) at Paiym in Porgera, Enga Province, and the third at Aitape in Sandaun Province.

The project will also develop an ASM curriculum and courses and provide training in its three centres.

Moreover, the EU is considering the feasibility of setting up micro-financing facilities for artisanal and small-scale miners. The last initiative, which is organised by the World Bank with funding from the Japan Social Development Fund will be described and evaluated in the remainder of the report.

13 Tok Pisin is the major lingua franca of Papua New Guinea.
An Introduction to the Partnership

The Japan Social Development Fund (JSDF) was set up by the Government of Japan and the World Bank in the year 2000 with the aim “to provide grants in support of innovative social programmes to help alleviate poverty in eligible client countries of the World Bank Group”. In May 2004 JSDF gave final approval to a grant of US$468,300 for a project aimed at improving the livelihoods and productivity of PNG small-scale miners while reducing their environmental and social impacts on local mining and mining-impacted communities.

This occurred in the context of a wider US$ 10 million World Bank loan (2000-2006) aimed at improving the sustainability of the PNG mineral sector by strengthening sectoral policies and institutional capacity. DoM was closely involved in the planning and implementation of the project and GoPNG committed 100,000 kina of counter-funding to it. The institution chosen to implement the Project was the Wau Ecology Institute Ltd (WEI). WEI had originated as a modest field station of the Bishop Museum of Honolulu, Hawaii, in 1961.

In the following decades it grew into a larger NGO with the additional support of the Smithsonian Institute (USA), the University of Papua New Guinea (UPNG), and the Papua New Guinea University of Technology (PNGUNITECH). Due to later changes in laws regulating PNG companies and NGOs, WEI converted its status to that of a local company to continue commercial activities like cash cropping and insect farming that helped sustain its research activities. However, the company remains a not-for profit organisation that is 100% nationally owned and managed by both nationals and expatriates.

Even though WEI’s assets and activities have deteriorated over the years, the Institute has a strong record in ecological research, community education and training, and applied research in conservation, sustainable agriculture and agroforestry, land and water resource management and development, and the monitoring of mineral resource extraction. Moreover, it has a number of facilities that were required for certain components of the Project, including lecture and seminar rooms and accommodation for those who took part in consultations, test lectures, awareness programmes, and training (see below).

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Its location at a short distance from Wau town was another reason for its choice as Implementing Agency for PNGJSDF. This is because the Wau-Bulolo District has a long history of gold mining and remains to this day the most important ASM centre in Papua New Guinea (Lole 2005). As a result, even though the Project was designed to assist and empower mining communities throughout Papua New Guinea, the WBD was chosen as the main focus of its initiatives.

PNGJSDF Partnership Expands

While PNGJSDF started as a partnership between the Japanese Social Development Fund, the World Bank, GoPNG/DoM, and the Wau Ecology Institute, it soon grew to include a number of other partners from the public and private sectors, civil society, and international donor agencies. For example, the Project’s Steering Committee (which was based in Port Moresby) included representatives from WEI, DoM, the World Bank, the PNG Chamber of Mines and Petroleum (PNGCMP), the European Union Sysmin Programme, and Metals Refining Operations Ltd. Similarly; its Wau-based Implementation Committee included a Community Relations Officer from Harmony as well as representatives from WEI and DoM.

As explained below, many of the Project’s initiatives have also been conducted in consultation with, and with the participation and assistance of, members of mining and mining-impacted local communities, educational institutions, various national government departments and provincial and local level governments, private companies and lending institutions, NGOs, and religious groups.

Furthermore, most of them linked- or have the potential to link- with the aforementioned assistance programmes by AusAid, the ADB, the World Bank, and the EU.

As will become apparent in the course of this report, the widely consultative style followed by the Project and the links it managed to create with local communities, national government departments, provincial and local level governments, the private sector, and other donor-funded initiatives were instrumental to the effectiveness and long-term sustainability of its interventions.
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PNGJSDF Winds Down

At present PNGJSDF is expected to close in March 2008. This means that some of its initiatives are still ongoing and that final reports have yet to be written for some completed components. As a result, I am only able to offer an interim description of the Project’s objectives and outputs. In particular, the number of people and Provinces involved in its training programmes may still increase in the coming months.

Similarly, some initiatives described herein as not yet completed or unlikely to be completed within the life of the Project may still be achieved in the coming months, particularly if extra funding and assistance are obtained from the various stakeholders networked by it.

With this in mind, the Project included eleven integrated components. Each of these was contracted out to a single consultant or a team of consultants through an open and competitive process and conducted in accordance with Terms of Reference (ToR) drafted and monitored by the Project’s Steering Committee (SC) and Implementation Committee (IC).

Project Outputs I: Booklets and Training Packages

Several Project consultants were hired to produce booklets and training packages that could be used to build the capacity of PNG artisanal and small-scale miners, thus enabling them to mine more efficiently and with fewer social, environmental, and health and safety impacts.

The first of these is a Curriculum on Toxic Substances including mercury, cyanide, and hydrocarbons, with particular emphasis on how to recognise and treat the symptoms they can cause and how to minimise the risks they pose. The second is a more general Community Health Booklet with information and guidelines on topics like nutrition, community hygiene, waste disposal, water supplies, sanitation, antenatal care, alcohol and marijuana abuse, HIV/AIDS, diarrhoea, STDs, malaria, filariasis, hepatitis, and tuberculosis.

Both booklets were drafted in consultation with the Department of Health, training institutions like the Divine Word University in Madang, the Institute of Medical Research in Goroka, the University of Papua New Guinea (UPNG) Faculty of Medicine, and relevant NGOs. Test lectures and community meetings with miners, local community representatives, health officers from the Wau-Bulolo District and Harmony, and university staff and students were also held in Wau, Madang, and Port Moresby.

A third consultant designed a Training Course on Appropriate Mining Technologies. This aims to teach how to increase the efficiency of mining techniques already used in Papua New Guinea and introduce PNG miners to new and more efficient tools and techniques at the non-mechanised, semi-mechanised, and fully mechanised levels.

The resulting package teaches how to prospect for and recognise different types of minerals; optimise the design and use of pans, sluice boxes, monitors, and screens; and reduce the use and impacts of mercury through its proper handling and disposal and by simple methods like hand picking, screening, more washing with water to get rid of as much waste as possible before adding mercury, and the use of shaking tables, gold wheels, and relatively cheap retorts and other methods of trapping mercury for reuse such as the tin-tin method

It also emphasises techniques that use gravity fed water as this reduces the use of machinery that is costly to acquire and maintain and that uses polluting and expensive fuels. To this end, it shows how to plan and build water races. Nevertheless, the course introduces the miners to water pumps and more complex machinery used to dig and move ground (e.g. bulldozers, front end loaders, hydraulic excavators, suction dredges, elevators, etc.), break rocks (e.g. stamp mills, impact crushers, ball/rod mills, etc.), and capture gold (e.g. screens, trammels jigs, spirals, etc.).

“Several Project consultants were hired to produce booklets and training packages that could be used to build the capacity of PNG artisanal and small-scale miners, thus enabling them to mine more efficiently and with fewer social, environmental, and health and safety impacts.”

In particular, it shows them how to use these machines, what it costs to buy and maintain them, and when it is or is not advantageous to use them (i.e. how much gold a day one must produce to make their use economically sound). To enable the miners to better plan their activities and moderate their impacts, the course offers simple advice on how to estimate the amount and depth of gold in their land and plan for and carry out land restoration as well.

14 Described in detail in Blowers (1988), Crispin (2003), and Department of Mining (1999b), this simple and inexpensive method uses two empty fish or meat tins, a gold pan, and damp ashes or sand to recover mercury for reuse.
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The same consultant who developed this course also taught it during some of the PNGJSDF training activities described below, and he modified the final version of it in accordance with feedback offered during these occasions.

A fourth consultant completed a Training Package in Business and Micro Finance Skills, which she taught during some of the PNGJSDF training activities described below. The package covers, among others, how to evaluate a business opportunity, complete a business plan, seek financing for a business, and meet the legal and administrative requirements (including bookkeeping) for the setting up and running of a business.

“To enable the miners to better plan their activities and moderate their impacts, the course offers simple advice on how to estimate the amount and depth of gold in their land and plan for and carry out land restoration as well.”

Despite being designed primarily for miners and gold buyers, the course teaches skills that are equally applicable to other commercial fields. As was the case with the previous course, the final version of this package was modified in accordance with feedback offered by those who attended the training offered by its author.

Another consultant drafted a Practical Guide for Community Clean Water Supplies. This booklet offers local mining and mining-affected communities simple guidelines on practical and cost effective methods to secure access to clean water supplies.

The document was developed in consultation with the Morobe Province Division of Health and the Wau-Bulolo District Administration, and on the basis of fieldwork obtained during test lectures and workshops with a total of 165 miners and members of mining-affected communities at Wau and Leklu village in the Wau-Bulolo District.

The same consultant working on this booklet was also tasked with designing and constructing two pilot water supply projects for the communities living at Leklu and the Wau Ecology Institute. At the time of my visit, the planning and costing of these facilities had been completed but their construction costs far exceeded the JSDF funding allocated to this project component. As a result, PNGJSDF was seeking alternative funding to complete this project component and the Morobe Provincial Government and Wau-Bulolo District Administration had expressed their interest to help.

A further project component involved the production of a specific Code of Safe Mining Practice for Artisanal and Small-scale Mining based on the Mining Act (1992), Mining (Safety) Act (1978), and Environment Act (2000). Its main sections include an introduction to the aforementioned Acts and guidelines on how to identify and mitigate common ASM hazards like falling objects or flooding, how to keep one’s workplace tidy, what protective equipment should be used for different tasks, how to handle toxic substances, and how to operate machinery as safely as possible.

The consultant drafted this code on the basis of field trips to PNG mine sites to investigate the actual hazards most common to them. Its final version took into account feedback given during test lectures conducted at the Departments of Engineering of PNG UNITECH and UPNG.

Another consultancy firm was contracted to write two booklets entitled: Environmental Code of Practice for ASM and Environmental Guidelines for ASM. These texts were written in consultation with DoM and the Department of Environment and Conservation and aimed to address the specific environmental risks associated with ASM by reference to the Environment Act (2000), the Mine (Safety) Act (1978) and the Mining Act (1992).

At the time of my visit a first draft of the booklets had been completed but was in need of some editing and was yet to be approved by the Department of Environment and Conservation. They included sections on how to reduce soil erosion and impacts on water systems, protect terrestrial and aquatic fauna and habitats, preserve sacred sites, and rehabilitate mining sites.

“The manual will also offer information on the National Goals and Directive Principles governing the development of non-renewable resources and information on the administrative and policy framework put in place to develop and administer the ASM sector.”

A final consultant worked on a Booklet on Laws Governing Small Scale Mining in PNG. This is supposed to incorporate the Mining Act (1992), Mine (Safety) Act (1978), Environment Act (2000), Central Banking Act (2000), and other pieces of legislation relevant to mining and the buying and selling of gold into a single paralegal training manual for artisanal and small-scale miners.

The manual will also offer information on the National Goals and Directive Principles governing the development of non-renewable resources and information on the administrative and policy framework put in place to develop and administer the ASM sector. However, at the time of my visit the booklet had not yet been completed.

For further information visit the Artisanal and Small-scale Mining in Asia-Pacific Portal on http://www.asmasiapacific.org
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Project Outputs II: Training of Trainers and the Artisanal and Small-Scale Mining Network

A different Project component aimed to set up a nationwide Artisanal and Small-scale Mining Network (ASMNet) that would help collect up to date information on the state of ASM in each PNG province, create greater awareness of its economic potentials and social, health and safety, and environmental challenges, and promote outreach training for ASM communities throughout Papua New Guinea.

The original plan was to bring selected representatives of mining communities, NGOs, and Provincial Governments from every province of PNG to the Wau Ecology Institute. There they would attend a Training of Trainers (ToT) course designed by an education specialist that incorporated all the topics covered in the aforementioned booklets and training packages. On completing the course, these “Provincial Coordinators” (PCs) were expected to seek funds from their respective provincial governments to run outreach-training programmes for local mining communities.

These programmes were to be conducted by the PCs themselves under the supervision of the education specialist who trained them in Wau. If their performance were judged satisfactory, the PCs would then receive official accreditation as ASM trainers and would be expected to organise further training for ASM communities at Local Level Government (LLG) level within their respective provinces.

“If their performance were judged satisfactory, the PCs would then receive official accreditation as ASM trainers and would be expected to organise further training for ASM communities at Local Level Government (LLG) level within their respective provinces.”

Due to the busy schedule of provincial government officials, which was aggravated by the need to prepare for national elections in the summer of 2007, not all provinces were able to send representatives to the courses. Nevertheless, a total of 33 PCs did attend ToT training at WEI. Among them were “role model miners”, landowners, NGO representatives, and government officials like Provincial Natural Resource Officers, Business Development Officers, Mining Liaison Officers, Patrol Officers, District and Community Development Officers, and District Managers.

These representatives came from the National Capital District and the 14 provinces of Bougainville, East New Britain, East Sepik, Eastern Highlands, Enga, Milne Bay, Morobe, New Ireland, Oro, Sandaun, Simbu, West New Britain, Western, and Western Highlands (see Map on page 3). Through a combination of taught classes, discussions, practical workshops and demonstrations, and field visits to local non-mechanised, semi-mechanised, and mechanised mining sites the PCs were given a practical introduction to the importance of the ASM sector and the opportunities and challenges it presents.

During the courses a representative from each province delivered a presentation on the state of ASM in their home province. This information, which included the number and distribution of miners within each province, the level of production and mechanisation of their operations, and some of the most common challenges faced by them, was then made available for inclusion in the ASM Database that is being prepared under another Project component (See below).

Despite the interest generated by the two ToT courses, only a few Provinces were able to commit counter-funding for PNGJSDF outreach training among their mining communities. This was mostly due to competing financial needs for other routine activities and preparation for national elections. However, the East Sepik Provincial Government fully funded a two-weeks outreach training that was carried out in June 2006 (see below).

The Autonomous Bougainville Government and the New Ireland Provincial Government also committed funding to conduct future training in their provinces. Similarly, other provinces like Morobe, Oro, and Simbu provided financial and/or logistical assistance to other PNGJSDF training programmes conducted within their borders (See below).
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Project Outputs III: Community Training

A very important aim of PNGJSDF was the provision of direct training for ASM communities throughout Papua New Guinea. Although the Project did not succeed in conducting outreach training in every PNG province, it still managed to carry out a number of training exercises in at least six of them. The first consisted of four one-week courses run by the same consultant who drafted the aforementioned Training Package in Business and Micro Finance Skills, with the participation of Wau Micro Bank staff. Two courses were held in Wau town, one in Bulolo town, and another one at Garaina, 71 people took part in them, of whom 60 were men. Although many participants were miners, some were customary landowners, cash croppers, gold buyers, trade-store owners, and employees and representatives of NGOs and women's groups.

“The very important aim of PNGJSDF was the provision of direct training for ASM communities throughout Papua New Guinea.”

The main objectives of these courses were to encourage miners, gold buyers, and other members of mining and mining-impacted communities to save money, equip them with better finance and management skills to run their mining operations and alternative businesses, and make them aware of, and better able to exploit, the financing opportunities offered by commercial banks, micro-financing institutions such as the Wau Micro Bank and the microfinancing scheme currently being investigated by EU Sysmin, and expatriate investors. A second training initiative combined the aforementioned Training Course on Appropriate Mining Technologies with a more general course along the lines of the ToT training package.

These courses were held in the Provinces of Eastern Highlands, Milne Bay, Morobe, Oro and Simbu for over 260 miners, gold buyers, customary landowners, and LLG representatives. A third important initiative involved a lecture for 35 miners and Wau-Bulolo District and Harmony health workers conducted by the consultant who prepared the Curriculum on Toxic Substances. The final programme was the aforementioned outreach training that took place in Wewak, East Sepik Province, in June 2006.

A total of 83 participants from all parts of the province took part in the courses. As with other PNGJSDF initiatives, the majority of them were miners and gold buyers but others were trade-store owners, subsistence and commercial farmers, teachers, LLG and District officers, representatives of women groups and church groups, and employees of conservation NGOs.

Project Outputs IV: Survey Methodology and Database for Papua New Guinea’s ASM Sector

Another Project component aimed to develop a standardised survey methodology and survey forms to collect reliable information on the PNG ASM sector. Moreover, it sought to create a single national database that would be used to store existing sectoral data and more up to date information collected during PNGJSDF activities and in future DoM surveys and outreach programmes. This would in turn provide the baseline data needed for sectoral networking, policy planning and implementation, and to seek investments and assistance from national provincial, and local level governments, international donors, and the private sector.

Two consultants worked on this component in consultation with DoM, the National Statistical Office, the Department of Mining Engineering at PNG UNITECH, and representatives of NGO groups, commercial banks, large mining companies, and small miners and ASM impacted communities. Test lectures were also conducted with IC members and second batch ToT course participants to obtain feedback on the design of the survey forms and methodology. At the time of my visit the survey forms had been completed along with a first interim version of a national ASM database. The survey was designed to include sections on demographics, mining methods, levels of production, revenue levels and utilisation, patterns of gold selling, access and use to financing, mercury use and toxicity awareness, levels of education and access to services, crime levels, child labour, alcohol and drug use, female participation, and occupational health and safety.

15 I was however unable to determine whether any data had actually been entered into it at the time of my visit.
It is expected that an additional database will also be developed as part of this project component to collect information on other participants in the gold industry, such as gold buyers, gold exporters, and laboratories and refineries. Moreover, the consultants working on this component are expected to train accredited personnel that will be responsible for managing the database and regularly uploading its contents on the Internet for easy accessibility. However, my understanding was that this had not yet been achieved at the time of my visit.

“... it sought to create a single national database that would be used to store existing sectoral data and more up to date information collected during PNGJSDF activities and in future DoM surveys and outreach programmes.”

**Project Outputs V: The Wau-Bulolo Gold Miners Association**

**WBD Miners Association - A Model for other PNG Districts**

The Wau-Bulolo District used to have a Miners Association that included primarily NGG and BGD tributers. However, the association has been inactive for many years and other mining and landowner groups like the Anga Miners Association, Kaindi Miners Association, Watut Development Corporation, and Biangai Development Corporation have been unable to effectively represent the interests of the District’s artisanal and small-scale mining communities.

In order to rectify this situation JSDF hired a consultant to help set up a new Wau-Bulolo Gold Miners Association (WBGMA). The idea was for it to serve as a single voice for the District miners and an interface between them and the private sector, donor agencies, NGOs, the National Government, the Morobe Provincial Government, and the various Local Level Governments of the Wau-Bulolo District.

If proven successful, it was envisaged that the Association would serve as a model for similar groups in other PNG Districts and Provinces, which could eventually coalesce in a broader national association that would effectively represent and foster the commercial, economic and social interests of Papua New Guinea’s artisanal and small-scale mining sector.

The appointed consultant held meetings with hundreds of potential association members, local landowners, and gold buyers from Wau, Bulolo, Watut, and Mumeng in order to muster support for the new Association, get a sense of the most pressing issues faced by them, and understand the main reason for the collapse of the old Association and the inability of other local groups to effectively represent their interests. He also consulted with District Administration managers, LLG representatives, and women’s groups’ representatives from various parts of the District.

The main concerns expressed in these meetings were the low prices allegedly paid for gold by local buyers, the hardships caused by fluctuations in international gold prices, the lack of financing available to artisanal and small-scale miners to invest in the acquisition of more efficient mining machinery, the lack of technical and legal information for the miners and of government support in reregistering expired leases, frequent land disputes and conflicts between miners and between miners and customary landowners, and fear over the possible impacts of Harmony’s operations on the livelihoods of alluvial miners operating downstream of them.

“JSDF hired a consultant to help set up a new Wau-Bulolo Gold Miners Association (WBGMA). The idea was for it to serve as a single voice for the District miners and an interface between them and the private sector, donor agencies, NGOs, the National Government, the Morobe Provincial Government, and the various Local Level Governments of the Wau-Bulolo District.”

In the end it was decided that, in order to comply with existing mining law, only registered and recognised miners, leaseholders, and tributers would be allowed to join the Association at first. The consultant prepared a Con-
stition for the Association and lodged an application to register it with the Investment Promotion Authority in August 2005. At first only 76 of the 133 miners recognised as potential members joined the WBGMA, but since then member numbers have continued to grow.

This money is used to cover the ordinary running costs of the Association and to finance the commercial activities described below. The Association is also supposed to keep a registry containing information (to be provided by its District Committees [see below]) on each of its members, which would include production levels.

**WBGMA’s Structural Organisation Includes all Stakeholders**

The WBGMA has a Wau-based elected Executive Committee that includes a President, two Deputy Presidents (of whom one must be a woman), a Treasurer, and a Secretary. It also has elected Liaison Officers and District Committees for each member LLG. Although all association members must be registered leaseholders, one honorary member each from women’s groups, youth groups, church groups, and the Wau-Bulolo District Local Level Governments are allowed to join it under the constitution.

The Association Board includes the Association Executives, the District Committees, and three independent directors from DoM, the Morobe Provincial Administration, and a suitable NGO. The first Association Officers and District Committees were elected in late October 2005. The Association was officially launched on June 29 2006 with a ceremony attended by the Deputy Governor of Morobe, the Wau-Bulolo MP, and over 560 miners and members of the general public. The first WBGMA general meeting and the election of new Office Bearers took place in March 2007.

An English and Tok Pisin “capacity-building course” was also designed by the consultant hired under this project component to train 80 Association members, Association Executives, Association Sub-Committees, Association District Committees for five LLGs, and representatives of local community groups (i.e. youth and women’s groups), NGOs, and Churches with an interest in the Association. The course (which is expected to be used to train members and officials of future Gold Miners Associations that may be formed in other parts of the country) covered topics like effective management, responsible leadership, and ethics and good governance.

The consultant also drafted an ambitious if rather schematic five-year business plan aimed at rescuing some of the problems expressed in the aforementioned consultation exercises while providing an independent financial basis for the future running of the Association. Among the things this called for was the establishment of a Miners Cooperative Society to buy and sell association members’ gold and buying of mining equipment to loan to members.

A second plan was drawn for a Miners Assistance Centre that would include, among others, a library containing literature of potential interest to the miners (such as copies of ASM-relevant legal acts and training manuals and booklets), a conflict resolution unit that would offer an informal venue for mediating land disputes between miners and between miners and customary landowners, and a women’s unit designed to represent and assist women miners and other women who live in mining or mining-impacted communities.

However, at the time of my visit the centre had not yet been set up due to difficulties encountered in repossessing two buildings that belonged to the old Wau-Bulolo Gold Miners Association and which are now occupied by private individuals. It is also unclear whether sufficient funding remains under this project component to renovate the two buildings and help set up the Centre.

“An English and Tok Pisin “capacity-building course” was also designed by the consultant hired under this project component to train 80 Association members, Association Executives, Association Sub-Committees, Association District Committees for five LLGs, and representatives of local community groups (i.e. youth and women’s groups), NGOs, and Churches with an interest in the Association.”

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16 The miners from the Garaina LLG had been unable to form a Committee.
**Evaluation of PNGJSDF Project Outcomes**

**Booklets, Training Packages, and Training Programmes**

As seen in previous sections of this report, all PNGJSDF booklets, training packages, and training programmes relate to legal, economic, technical, health and safety, and environmental issues that are faced by most if not all ASM and ASM-impacted communities within Papua New Guinea, but on which the miners are provided very little (if any) accessible information and practical guidelines (Crispin 2003; Lole 2005; Susapu and Crispin 2001).

As such, their relevance is not confined to the Wau-Bulolo District but spans the entire country. Moreover, as many Asia-Pacific artisanal and small-scale miners suffer from an analogous lack of “information, awareness, and education on the technical, economic, and environmental aspects of their activities”, the drafting of similar material and the provision of comparable training would be of value to other parts of the region.

Indeed, it is even possible that some of the materials produced by PNGJSDF- such as the Curriculum on Toxic Substances- may even be directly exported to other parts of the region or serve as a basis for comparable booklets and curricula to be used in other Asia-Pacific jurisdictions.

The particular value of these booklets, training packages, and courses is tied to their capacity to translate complex technical information and legislation like the Mining Act (1992), Mining (Safety) Act (1978), Central Banking Act (2000), and Environment Act (2000) into simple classes, codes, and guidelines that can be easily understood by grassroots miners and gold buyers.

In this sense, the fact that they were drafted in consultation with specialists from relevant GoPNG Departments, academic institutions, industry, NGOs, and donor agencies and on the basis of feedback received during test lectures and actual training programmes for grassroots miners should have helped to guarantee the relevance, accuracy, and accessibility of their contents and style of delivery. In order to ensure that miners with relatively little formal education will easily understand them, the booklets and training packages have also been kept (or, for those still in preparation, are expected to be kept) as concise as possible (typically 6,000 words for booklets).

Moreover, all have been written (or are expected to be written) in simple English and most incorporate (or are expected to include) drawings, photos, videos, and practical demonstrations and exercises that clearly illustrate the points made in their texts. And finally, it is expected that all booklets and some (or parts of some) of the packages will be translated in Tok Pisin within the life of the Project.

As the lack of clear and easily accessible legal, technical, and financial information was one of the most common complaints I heard during fieldwork in 2004-2005; the booklets could become a valuable resource for the artisanal and small-scale miners of Papua New Guinea. And indeed, similar booklets prepared under the aforementioned AusAid programme of 1999-2001 would appear to have proven popular among those local mining communities who were able to obtain them (Crispin 2006).

Of course, the ultimate effectiveness of this aspect of the Project will depend on a variety of factors. In the first instance, this will be whether or not outstanding booklets are completed and whether they are all translated in Tok Pisin within the life of the Project. In addition, the booklets and courses will have to be disseminated as widely as possible. In turn, this demands that they be distributed in printed form and incorporated in community training and outreach programmes.

In this sense, my understanding is that some funding is already available for the printing and distribution costs of a first batch of booklets and that additional financing is being sought to help with this task.

At the moment it is envisaged that these materials may be printed and distributed in hard form at cost through project partners like the Wau Ecology Institute, the Department of Mining/MRA (see below), the PNG Chamber of Mines and Petroleum, MRO, and other relevant government departments and agencies.

interested provincial governments. The money recovered with every sale would then be used to print more copies for distribution.

In addition to this, the booklets and packages have already been disseminated through PNGJSDF activities like the Training of Trainers, Microfinance Training, Appropriate Mining Techniques Training, East Sepik Province Outreach Training, and the WEI lecture on mercury and other toxic substances commonly used in ASM operations. What is more, the future impact of these materials could be ensured by their incorporation in the curriculum to be developed for the three ASM training centres currently being built by the EU.

Similarly, the materials could be used in future outreach training offered by provincial governments through the ASMNet and by the Department of Mining. Indeed, the recent transformation of the latter into the Mineral Resources Authority (MRA)- a Statutory Authority funded through a 0.25% levy on gold production that has the capacity to hire directly- increases the likelihood that enough staff and financial resources will be made available for this kind of technical assistance.

Moreover, the fact that participants to PNGJSDF’s outreach training at Wewak were willing to pay fees of one hundred kina for the course, and that courses on ASM principles offered in some PNG urban centres like Lae are oversubscribed despite charging fees several times higher than that suggests that future outreach training programmes based on PNGJSDF materials could be offered by MRA staff or especially hired consultants through a user pay policy. And finally, the endorsement of the booklets and training materials by other relevant government departments could be crucial in terms of their future sustainability and impacts.

In relation to this last possibility, the greatest success to date has been the Department of Health’s endorsement of the Curriculum on Toxic Substances, which will now be used to train community health workers, health extension officers, allied health workers and nursing officers, and nurses and doctors throughout PNG. This is important because to date PNG health staff have not been trained and equipped to recognise and treat mercury poisoning (Susapu and Crispin 2001).

In turn, this has made it harder for the miners themselves to appreciate the dangers associated with this substance. For instance, in 2004-2005 some of my Kaindi informants had heard that mercury is a dangerous substance, but still maintained that its effects are not as serious for Papua New Guineans as they are to Europeans and others. This assessment was partly based on the fact that no local miners had ever been diagnosed as suffering from mercury poisoning. In this light, a greater capacity to diagnose local cases of mercury poisoning may be expected to lead not only to the treatment of those affected, but also to greater local recognition of the real dangers it poses for human health.

Some of the miners I interviewed in September 2007 claimed that, as a result of PNGJSDF awareness programmes, they had started to wonder whether some of the ailments they and other miners had been suffering from for some time may be connected with their exposure to mercury. In turn, they claimed that this had made them less likely to engage in practices like standing downwind of open fires on which gold was being retorted, or retorting gold near houses or gardens.18

As for the other training initiatives conducted by PNGJSDF, these have already led to some positive outcomes. In particular, the East Sepik Province Outreach Training resulted in the collection of more up to date information on the state of the local ASM industry, including an increase in the estimated number of miners from 10,000-12,000 (Crispin 2003) to 17,658. Moreover, as a result of the business and microfinance component of the course, more than 25% of participants opened new accounts with the ESP branch of the Wau Micro-Bank at the end of it. And the participants also set up an In-

18 The importance of presenting miners with direct examples of the effects of mercury poisoning is further demonstrated by the fact that one of the most important factors in changing people’s minds during past AusAid-sponsored outreach programmes was a video that showed the effects of mercury poisoning in Minamata Bay in Japan and on small-scale miners in Brazil (Susapu and Crispin 2001).
Continued from page 25 - Evaluation of PNGJSDF Project Outcomes

interim Working Committee to establish an ESP Gold Miners Association modelled on the WBGMA.

Furthermore, the Provincial Administrator committed to the inclusion of ASM in the upcoming Provincial Development Plan. At the end of the course people asked for books on mining laws and methods in Tok Pisin, which is a further sign of the potential interest of the booklets currently being prepared by PNGJSDF. Moreover, many expressed their appreciation of the fact that the course was conducted in Tok Pisin and that it included not just formal lectures but also open discussions, role-playing, audiovisual shows, and practical class and field demonstrations. This is something that should be borne in mind in the design of future training programmes, including those to be conducted in the EU financed training centres.

Those I was able to interview in Wau who had attended PNGJSDF Microfinance Training classes were generally positive about the course. In particular, they claimed that it had encouraged them to try save more and had given them a better idea about how to run their future operations. However, they also noted that the course should have been longer because some of the concepts covered in it were quite difficult to grasp in a limited amount of time. Similarly, they wished that a financial advisor could be made available to assist them on a more permanent basis through PNGJSDF, DoM/MRA, the Wau-Bulolo Gold Miners Association, or the Wau Micro Bank.

Other informants who attended Appropriate Mining Techniques Training found the course useful, particularly in alerting them to the potential uses, advantages, and costs of new mining machinery. They also realised that they themselves, their workers, their tributers, or other miners they knew had not always made the most effective use of simple mining techniques and equipment like sluice boxes.

Nevertheless, these leaseholders were generally more interested in finding financing to mechanise their operations than in improving the efficiency of non-mechanised operations conducted on their land.

In the first instance, this was because they were primarily interested in the more lucrative hard-rock mining that machines would allow them to carry out. Moreover, as they feared that the government would take away their leases unless they managed to mechanise their operations and increase their productivity, they saw little point in investing energy to improve the non-mechanised alluvial mining of their land.

This reluctance was compounded by the fact that the alluvial mining conducted on their land was done primarily by their tributers and workers, who were then expected to turn a percentage of what they won over to them. However, as the leaseholders felt that tributers and workers alike failed to pay them a fair share of their gold earnings, they were not interested in passing the knowledge they had acquired in the courses over to them.

On the other hand, the course may have had a different impact on those participants who were primarily and directly engaged in alluvial mining. For example, a report from the national press suggests that such participants may have succeeded in increasing the production of their operations by applying some of the techniques they had learned in the course (Muri, No Date). Furthermore, the training has already achieved other significant results. For instance, during the course held at Misima it was discovered that mercury had been introduced among ASM communities who had previously not made use of it, and who were unaware of its toxicity. Because of this lack of awareness, the miners were placing mercury directly in their sluice boxes, from where it could easily escape into the environment.

However, as a result of the awareness created by PNGJSDF, the miners asserted that they would stop doing that and that they would use mercury with greater care. And in more general terms, my WBD informants were pleased about the training offered by PNGJSDF, not just because of what they had learnt through it, but also because they hoped that it was a sign that GoPNG, international donors, and other stakeholders had committed to providing continuous support for the ASM sector.

In conclusion, although the actual outcomes of the community and outreach training offered by PNGJSDF will only be revealed by a systematic survey of the saving patterns and...
Continued from page 26 - Evaluation of PNGJSDF Project Outcomes

mining operations of those who took part in it, there are indications that it has already had positive results in many parts of Papua New Guinea. Because of this, and given that similar training programmes conducted in the past are already known to have generated positive outcomes (Crispin 2003; Susapu and Crispin 2001), it is important that the provision of such training should continue in the future.

Thankfully, there are good indications that this will indeed be the case, not only thanks to the construction of three mining training centres by the EU, but also as a result of the interest and partnerships generated by the Training of Trainers and ASMNet promoted by PNGJSDF.

**Training of Trainers and ASMNet**

As already seen the Training of Trainers programme did not lead to the anticipated accreditation of provincial ASM trainers or the delivery of outreach training in all PNG provinces. Nevertheless, it did bring together provincial government officers, miner role models, and NGO representatives from 14 provinces plus the National Capital District. During their training the representatives presented up to date information about the ASM profile of their respective home provinces, which can now be included in the national ASM database being prepared by PNGJSDF. Even more importantly, the initiative generated greater awareness of the importance of promoting and regulating ASM on the part of many provincial governments.

The immediate result of this was that some of them provided funding and logistical support for PNGJSDF outreach and community training programmes conducted in their jurisdictions. In the longer term, the establishment of a nationwide ASMNet may result in a greater willingness and capacity on the part of provincial governments to work with their LLGs, central government, and each other to assist their ASM populations. And although only time will tell whether the ASMNet is sustainable, its creation has already led to some positive outcomes and could undoubtedly serve as a model for analogous initiatives in other parts of the Asia-Pacific.

**Survey Methodology and Database for Papua New Guinea’s ASM Sector**

As already discussed, the lack of accurate baseline data on the PNG ASM sector is a major obstacle to the development of effective partnerships with ASM communities and in sectoral policy making, implementation, and regulation (Lole 2005). If appropriately completed, this Project component will therefore benefit Papua New Guinea as a whole.

Furthermore, the availability of more accurate data on PNG ASM would also contribute to regional comparison and facilitate the tasks of regional networking. And finally, if proven successful the survey forms and methodology and the database developed under this project component could serve as a model for similar resources in other Asia-Pacific countries.

**The Wau-Bulolo Gold Miners Association**

**WB Gold Miners Association Faces Hurdles**

The Wau-Bulolo Gold Miners Association was intended to represent all District miners and to advance their interests through its own business activities and by acting as an interface between them and central, provincial, and local governments, donor agencies, NGOs, and the private sector. Although only 76 of the 133 miners recognised as potential members joined the Association in its first two registration rounds, its membership has since grown to 99 people. Yet, despite this expansion, at the time of my visit no WBGMA Committee had yet been established in the Garaina LLG, whose mining population was therefore still not represented in the Association.

A second issue is that those members who live farther from Wau find it more costly, time consuming, and difficult to travel to attend Association meetings. In turn, this means that even important events like General Meetings may end up being dominated...
Continued from page 27 - The Wau-Bulolo Gold Miners Association

by those living closest to Wau, and that those living farther away may end up feeling inadequately represented within and by it. This is particularly problematic because the WBGMA Constitution states that the election of Association Officials should take place in General Meetings, that a turnout of 50% of members is sufficient to validate the meeting and elections, and that the winning candidate for each position is simply that who has received the highest number of votes from those present.

That this is a real problem is confirmed by the fact that the Association’s first general meeting was attended by little more than 50% of its registered members. Even more importantly, however, the current WBGMA Constitution states that only registered leaseholders are allowed to join the Association. This requirement was put in place because no mechanism has yet been designed and implemented to allow MRA to properly recognise tributers and customary miners. But although it makes sense vis-à-vis the need for a greater regulation of the sector, the rule effectively excludes thousands of District miners who tribute for registered leaseholders or work on customary land from being given a voice through the Association.

Association Faces Constraints in Ability to Assist Members

Aside from the issue of representation, the Association has faced a number of constraints to its capacity to assist its members. Since its official launch WBGMA has made several representations to the Morobe Provincial Government for financial assistance, but although these requests were sympathetically received, no funding had yet been forthcoming at the time of my visit. The inability to recover the old Gold Miners Association’s buildings in Wau has further constrained the operational capacity of the new Association and has impeded the setting up of a Miners’ Assistance Centre under the auspices of PNGJSDF.

The Association’s attempts to generate its own funding by implementing some of the commercial activities envisioned in its five-year business plan have also run into significant difficulties. In particular, its members have been reluctant to pay extra money in addition to their fees to finance such enterprises. However, at the time of my visit the Association had just started a gold buying scheme. The idea was to give some of the money raised from its members to small gold buyers operating in various District localities.

The buyers would then buy gold from WBGMA members at slightly higher prices than those offered by most local buyers. Thereafter, they would sell the gold on to a larger exporter who had agreed to pay higher than average prices in order to secure the regular gold volumes needed to maintain his export licence. It remains to be seen whether the scheme will prove popular and profitable enough to remain sustainable, let alone to provide a significant income for the Association.

Despite Setbacks WBGMA Improves Situation

Despite the difficulties it has encountered, WBGMA has managed to remain active and grow since its inauguration. Moreover, it has provided inspiration for the formation of a similar Association in East Sepik Province, thus demonstrating its potential relevance and appeal to ASM communities throughout Papua New Guinea. If provided with the right level of support by government, donors, NGOs, and the private sector, the Association may continue to grow and come to play an important role in tackling some of the problems faced by the artisanal and small-scale miners of the Wau-Bulolo District and, through its sister organisations, other parts of PNG.

In particular, it could assist MRA efforts to

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Selling Gold.
obtain statistics on the ASM sector by gathering production data from its members. Secondly, it could represent the miners’ views to government, and vice-versa. Thirdly, it could serve as a mediation forum for land disputes between miners and between miners and landowners, a problem that is particularly acute in the WBD where, as mentioned above, many leaseholders are not “customary landowners”, but which is also significant in other parts of the country.

Fourthly, it could assist initiatives like the establishment of “free trade gold”. And finally, it could facilitate government and donor efforts to provide microfinancing for artisanal and small-scale miners.

In this light, an interesting proposal is that WBGMA membership may be made into a precondition for accessing the microfinancing opportunities that may become available to WBD miners under the EU Sysmin assistance programme. Without a doubt, this would enhance the value of WBGMA membership and may help the Association to grow. However, if this requirement were put in place it would be even more imperative to make Association membership as fair and inclusive as possible.

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The Association Secretary, who holds the Association registers, was in Lae for the whole duration of my visit to Wau. As a result, I was unable to check whether any production records had actually been obtained by the Association.

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Gender Equality and Female Empowerment

**ASM Sector Poses Challenges to MDG3**

As reported above, the ASM sector poses significant challenges to the achievement of MDG3, which calls for the promotion of gender equality and the empowerment of women. To begin with, women are often prevented from participating in, and benefiting from, ASM to the same extent that men do. This is partly because they are expected to engage primarily in other kinds of activities like subsistence gardening or child rearing. But in addition to this, in the Wau-Bulolo District and other parts of PNG men tend to regard mining as a quintessentially male activity. As a result, they either try to prevent women from participating in ASM altogether or attempt to control female mining labour and retain control over what is produced through it.

This exclusion and subordination is in turn sustained and aggravated by a variety of factors, including almost complete male control over both customary land and registered mining leases, the fact that women do not have as many opportunities to acquire mining skills as their male counterparts, and greater male control over decision-making in both domestic and public contexts (Crispin 2004; Krimbu 2005; Moretti 2006; Siove 2005).

The results of this are that women do not have equal access to cash through mining, that they are not able to retain control over what minerals they produce or help produce, and that they are often unable to access a fair share of their partners’ mining earnings for the running of their households or the creation of alternative cash-earning activities. But if they do not fully benefit from the cash earning potential of ASM, women still suffer from many of its negative impacts.

For example, enhanced male participation in ASM means that women living in mining communities must often take on tasks that were “traditionally” carried out by men as well as their own “traditional” chores, which in turn increases the female workload. Similarly, the lack of access to clean water characteristic of many ASM communities is particularly harsh for women because they are the ones who have to walk a long way to fetch cooking and drinking water as well as to wash clothes and cooking implements.

**PNGJSDF Initiatives Incorporate Gender Equality Elements**

Although PNGJSDF did not include a component specifically designed to enhance gender equality and empower and assist women in mining and mining-impacted communities, many of its initiatives incorporated elements that...
and provisions that aimed to do that. For instance, several of the booklets, training packages, and training programmes developed and conducted under its auspices contained sections designed to increase awareness of the issues commonly faced by women living in ASM and ASM-impacted communities as well as effective guidelines on how to mitigate them.

Furthermore, the initial list of possible participants in the Training of Trainers programme included one woman per province. In turn, this was done not only to increase technical knowledge and awareness of the ASM sector among female officials and miners, but also to include a female presence in the ASMNet established through the programme. Similarly, a provision was included in the WBGMA Constitution to ensure that one of its two Deputy Presidents must be a woman. In turn, this was done to guarantee at least one female presence in the Association’s Executive Committee and Board of Directors. In addition, the Constitution states that although full WBGMA membership is restricted to (at least at present) registered ML and AML holders, one representative from a women’s group may from time to time be appointed as an honorary member.

Despite Gender Equality Features, PNGJSDF sometimes Fails Women

But if it was clearly designed and implemented with MDG3 in mind, PNGJSDF was not always effective at promoting greater gender equality and female empowerment through its various activities. For instance, despite the provisions made by the Project no female miners or officials attended its Training of Trainers programme. Similarly, though the consultant hired to set up the new WBGMA consulted widely with local mining and mining-impacted communities, less than 7.6% of those who took part in these consultations were women.

Furthermore, while the constitutional requirement that one WBGMA Deputy President must be a woman may help to increase female representation within the Association, the current restriction of full membership to registered leaseholders goes completely against this objective. Indeed, although national estimates and my own observations at Mount Kaindi suggest that around 20% of WBD miners are women, only some 5% of the MLs and AMLs registered in the District are officially owned (though not always actually controlled and run) by women (Aviong 2005).

As a result, women may be expected to represent only a small percentage of the Association’s current membership. In turn, this means that the female Deputy President can be elected only from a very restricted pool of candidates and, even more significantly, that being numerically low female votes have a limited weight in the running of the Association.

While the Constitution states that a representative from a women’s group may from time to time be appointed as an honorary member, the said representative is not permitted to vote in Association meetings and is not included in the WBGMA Executive Committee and Board of Directors. And finally, as the planned WBGMA’s Miners Assistance Centre has not yet been set up, there is currently no Association unit specifically...
charged with representing and assisting women.

Few Women Take Part in PNGJSDF Community and Outreach Training

Moving on to a different issue, women constituted only a minority of those who took part in PNGJSDF community and outreach training. Indeed, just 11 of the 71 participants in the Microfinance Training programme were women. Similarly, less than 10% of 83 people who attended the East Sepik Province Outreach Training were female. And finally, women would appear to have made up as little as 6.5% of those who took part in Appropriate Mining Techniques Training.

Now, the fact that on average just 28% of participants in past outreach programmes carried out by DoM/AusAid in mining communities throughout Papua New Guinea were women confirms that getting women involved in ASM training is no easy task (Crispin 2006).

This is not only because there are fewer female than male miners (and possibly fewer women than men interested in being miners), or because male miners may discourage women from attending such courses.

On the contrary, a number of other factors may also contribute to constrain female participation in community and outreach programmes. For example, women may feel uneasy at the idea of attending what they may expect to be a male-dominated event (Crispin 2006). Furthermore, they may be kept from joining such courses (and particularly those with a longer duration) because they are primarily responsible for other daily activities like gardening or child minding.

If the courses are held at some distance from where they live, women may also be more deterred than men from attending by the risks and costs involved in travelling to, and then staying at, the venue for the course. Moreover, they may find it harder to raise the cash needed to pay the fees required to attend courses like the East Sepik Province Outreach Training, even though these may be comparatively small.

And finally, it must be remembered that PNGJSDF or other organizers of such courses are not always in charge of choosing who will attend them, but must rely instead on the efforts of Provincial or Local Level Government officials, which may in turn rely on the assistance and choice of (typically male) community leaders.

Future Programs Must Promote Greater Female Participation

But precisely due to these many difficulties, it is essential that future assistance programmes make an even greater effort to individuate and mitigate obstacles to female participation in consultative meetings and awareness and training initiatives. And this is not just due to the need to promote greater gender equality and female empowerment in ASM, but, given that women already account for 20% of PNG miners, because training female miners is crucial to the broader aim of achieving greater economic and environmental sustainability within the sector.

Moreover, considering that female miners are often forced to take their children with them to the mines, making women more aware of, and better able to reduce, the risks posed by mercury or dangerous working practices and environments is also particularly important for the protection of children living in mining communities. Of course, increasing female representation and participation in the Wau-Bulolo Gold Miners Association and similar organisations that may be formed in other parts of the country is also essential to empowering women miners and ensuring that these bodies are representative of, and responsive to, the interests and needs of all miners and members of mining communities.

In this light, rules that restrict membership to almost wholly male registered leaseholders need to be reviewed. In fact, this is made even more pressing by the possibility that WBGMA membership may be made into a condition for accessing the ASM micro-financing that may soon be provided with EU funding.

“...women may feel uneasy at the idea of attending what they may expect to be a male-dominated event...”

“...considering that female miners are often forced to take their children with them to the mines, making women more aware of, and better able to reduce, the risks posed by mercury or dangerous working practices and environments is also particularly important for the protection of children living in mining communities.”
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ASM Asia-Pacific Case Study Series

This series of case studies documents concrete examples of equitable, effective, and sustainable local-level partnerships including small-scale miners or their communities as a guide to develop better policy and practice in the Asia-Pacific region. The project has been led by Kuntala Lahiri-Dutt. The case studies have been edited by Joel Katz and designed by Rachel P Lorenzen.

Artisanal and Small-Scale Mining (ASM) in Asia-Pacific Portal

The ASM Asia-Pacific Portal is the public interface of a loose network of individuals and institutions working on poverty eradication, development and livelihoods in Artisanal and Small-scale Mining (ASM) in the Asia-Pacific region. The portal’s mandate is to disseminate knowledge about ASM in the Asia-Pacific, to document best practice in community development and environmental management, and to promote fellowship and cooperation among stakeholders interested in poverty eradication and sustainable development.