

‘Farming miners’ or ‘mining farmers’?: Diamond mining and rural development in post-conflict Sierra Leone

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Abstract

Sierra Leone is currently emerging from a brutal civil war that lasted most of the 1990s, and now has the dubious distinction of being ranked among the world’s poorest countries. As thousands of displaced people move back to their villages, a large proportion of the predominantly farm-based rural population are growing food crops for the first time in a decade. Alluvial diamond mining makes an important contribution to the national economy, though some would argue that Sierra Leone’s diamonds are a ‘resource curse’. Drawing upon research undertaken in the 1970s and also in the post-conflict period, the paper provides a longitudinal perspective on the complex links between the farming and mining sectors. Recent field research in Sierra Leone’s Eastern Province, indicates that many links between farming and diamond mining have actually been maintained despite severe dislocation. These links could play a key role in rejuvenating market-oriented food production, providing the much-needed impetus for post-war rural development. In charting a future development trajectory, the paper recognizes the urgent need for an effective management scheme for both mining and marketing diamonds, given the potentially destabilizing effect on the country of the uncontrolled exploitation of this valuable resource. In this context, a recent community-based, integrated management initiative adopted by one local NGO, the Peace Diamond Alliance, is examined. If meaningful rural development is to be achieved among desperately poor communities, development strategies must be based on a detailed understanding of the nature of inter-locking livelihoods in the agricultural and mining sectors.

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1. Introduction

A variety of economic and social development indicators suggest that the small West African state of Sierra Leone is among the poorest countries in the world (UNDP, 2005). Sierra Leone’s economy and quality of life deteriorated rapidly during the ‘lost decade’ of war during the 1990s, when many people were forced to flee their homes and abandon their livelihoods due to the rebel insurgency. With the restoration of peace in 2002, and the successful conclusion of presidential and parliamentary elections on 14 May 2002, the country and its people are now faced with the massive task of reconstructing communities, institutions and structures, and rebuilding economy and liveli-

hoods. One of the key priorities in the transition from war to peace will undoubtedly be creating a safe and enabling environment for forced migrants to return home and rebuild their mainly farming-based livelihoods (Binns and Maconachie, 2005).

The causes of Sierra Leone’s debilitating conflict were multifaceted and complex, and much has been written about the political economy of the war (see for example, Keen, 2005; Richards, 2003). There is now a considerable literature focusing on ‘blood diamonds’ and the economic dimensions of the conflict in Sierra Leone (and indeed other diamond-fuelled African wars, such as those in Liberia, Angola and the Democratic Republic of Congo), with particular attention revolving around the ‘greed vs. grievance’ thesis¹ (Collier, 2000; Berdal and Malone, 2001).

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¹In studies concerning the political economy of war, the literature remains divided over the relative importance that each of these causal

While some observers have argued that the point of the war may not actually have been to win it, but rather ‘to engage in profitable crime under the cover of warfare’ (Smillie, 2000, p. 24), others maintain that there is little evidence to suggest that diamonds, Sierra Leone’s most precious resource, were the fundamental cause of the conflict (Richards 2003). There does, however, appear to be some consensus that diamonds played a key role in fuelling and prolonging the war, as various parties to the conflict undoubtedly funded their war efforts through mining activities.²

The role that diamonds assumed in Sierra Leone’s protracted conflict ties into larger debates that concern the so-called ‘resource curse’ syndrome of African countries, where it remains unclear as to whether an abundance of natural resources is either a blessing or a boon for socio-economic and political development. A number of prominent economists have argued quite forcefully that an over-reliance on natural resources can have adverse consequences for economic growth (Auty, 1993; Sachs and Warner, 1995). Moreover, other observers have argued that, with few exceptions, mineral-rich developing countries are often subjected to continuing underdevelopment, corruption, political instability, and in some cases, violent civil war. In fact, a number of studies have even demonstrated that there is a strong statistical correlation between a developing state’s reliance on natural resources and the likelihood that it will suffer from civil war (Collier and Hoeffler, 2001; Elbadawi and Sambanis, 2002). Ross (2003) shows that of all the major kinds of natural resources, diamonds and illegal drugs were the most strongly associated with civil wars that took place between 1990 and 2000. He suggests that it is the ‘lootability’ of a resource, or whether or not it has a high value-to-weight ratio and can be easily appropriated and transported by unskilled workers that determines the impact that a particular resource will have on the potential for war.³ However, he also points out that there is another side to lootable resources: in non-conflict situations, they tend to produce more widespread benefits for local people and the poor than do unlootable commodities.⁴

(footnote continued)

factors assumes in the incidence of conflict. While the ‘greed’ theory argues that looting and resource capture are the prime motives for rebel actors, proponents of the ‘grievance’ theory maintain that justice-seeking for marginalized social groups remains the driving factor in the onset of violent rebellion.

²Informants from the diamond area of Tongo Field, near Panguma, were able to provide detailed accounts of widespread and uncontrolled mining by the Revolutionary United Front (RUF) during the conflict, describing how even the secondary school playing field and the airstrip were mined by rebels to fund their war efforts.

³Ross (2003) notes that natural resources tend to have a different impact on separatist conflicts than they do on non-separatist conflicts. ‘Unlootable’ resources, such as oil, natural gas, or deep-shaft minerals, are more commonly associated with prolonged separatist conflicts.

⁴The logic for this observation lies in the fact that lootable resource extraction relies more heavily on the use of unskilled labour, whereas the extraction of unlootable resources requires a higher degree of skilled

Rather than re-visit arguments that have been rehearsed repeatedly elsewhere, this paper attempts to bypass the debate concerning whether the war in Sierra Leone was fought with, or over diamonds. Instead, attention is focused on the point made by Ross (2003) concerning the potential benefits that lootable resources may have for local communities. The thrust of the discussion explores the role of alluvial diamond mining in the post-conflict scenario, and addresses a number of key questions concerning interactions between mining activities and the rural sector, including labour mobility. Within the field of migration studies, there is a well established body of literature that looks at seasonal labour movements in Africa (De Haan et al., 2000, 2002; Cordell et al., 1996). But as De Haan and Rogaly (2002) point out, there has been comparatively little work that links temporary mobility at the micro-level with wider changes in rural societies. Similarly, while there have been a number of studies that have examined forced migration in conflict situations (for example, see Black, 1998), little research has focused on sustainable return in post-conflict environments. This article attempts to link these two deficiencies in the migration literature, and seeks to show how temporary or seasonal labour mobility at the micro-level is inextricably linked to wider societal change in Sierra Leone, and is in fact an essential pre-condition for the creation of an enabling environment for sustainable post-conflict return.

The ‘sustainable livelihoods’ approach provides a useful conceptual framework to guide the discussion, and the first section of the article briefly reviews this model. A broad overview of the mining sector in Sierra Leone then follows, exploring elements of continuity and change since the 1970s, when one of the authors first undertook fieldwork in the area (Binns, 1981). The paper provides a valuable longitudinal assessment of the significant links between farming and mining that were evident in the 1970s, and which recent field-based research has revealed are still a key feature, performing an important role in both local livelihood portfolios and the rural economy. The future potential of the so-called ‘development diamonds’ is then considered, and it is suggested that with favourable conditions, desperately poor rural communities could benefit substantially from the reinvestment of diamond income into local economies. However, it is pointed out that such a development trajectory has many hurdles to overcome. The paper concludes by examining the Peace

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labour and capital. In other words, unlootable resources are more likely to generate revenues for skilled labourers, for those who have access to the capital required for extraction, or for the government. In poor developing countries, particularly in Africa, skilled labourers and capital are more likely to come from outside the region of extraction, and possibly even from outside the country. A good example of such a situation is the oil producing region of the Niger River Delta in Southern Nigeria, where foreign capital and labour dominate the oil extraction process and local communities, such as the Ogoni people, remain poor and marginalized (this is well described in Watts, 1997).

Diamond Alliance, a recent community-based initiative that is attempting to tackle some of the problems associated with diamond mining, in order to ensure that more benefits from the production and marketing of diamonds accrue to the communities of origin.

2. The sustainable livelihoods framework

In recent years, the concept of sustainable livelihoods has become a central feature of development discourse. This approach is premised on the idea that communities derive their livelihoods from different types of ‘capital’. In this context, ‘sustainability’ is defined as the maintenance of stocks or capital over time, and a sustainable society is one that is able to nurture and enhance these stocks (Warren et al., 2001). Although there are a number of different adaptations of the sustainable livelihoods model, the main concept remains the same. Following the definitions provided by Scoones (1998, pp. 7–8), five main types of capital are commonly identified (Fig. 1).

At any specific moment in time, individuals or households may possess different combinations of capital in their livelihood ‘portfolios’. Indeed, if a household is lacking in one category of assets, capital might be converted from one form into another (Stocking and Murnaghan, 2001), but ultimately, changes in the level of available assets may affect the ability to engage in sustainable practices. Livelihood portfolios are therefore dynamic, and livelihood strategies are susceptible to change over time and space, as local and external conditions change. Thus, according to Chambers and Conway (1992):

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (cited in Scoones, 1998, p. 5).

- **Natural capital** – the natural resource stocks (soil, water, air, vegetation) which are essential for sustaining livelihoods.
- **Economic or financial capital** – the capital base (cash, credit, savings, remittances and economic assets), which allows individuals and households to make livelihood decisions about investments in natural, human or other forms of assets.
- **Human capital** – the skills, knowledge, ability to provide labour and good health, and physical capability which allows individuals and households to successfully pursue different livelihood strategies.
- **Physical capital** – the basic infrastructure, manufactured goods and tools which are required to produce or pursue livelihood strategies.
- **Social capital** – the social resources and relations (networks, social claims, relationships of trust, affiliations, associations) upon which people draw when pursuing different livelihood strategies that demand coordinated actions.

Fig. 1. Sustainable livelihoods—types of capital. Adapted from Scoones (1998).

Scoones (1998) adds that within the sustainable livelihoods framework, there are three broad ‘clusters’ of livelihood strategies: agricultural intensification/extensification, livelihood diversification and migration. He notes, “Either you can gain more of your livelihood from agriculture...through processes of intensification (more output per unit area through capital investment or increases in labour inputs), or extensification (more land under cultivation), or you diversify to a range of off-farm income earning activities, or you move away and seek a livelihood, either temporarily or permanently, elsewhere” (1998, p. 9). More commonly, individuals may pursue a combination of strategies in their livelihood portfolios. In improving and safeguarding their livelihood base, households do not merely rely on agriculture alone, but rather they draw on a wide range of other resources, including non-farm activities and migration.

There is now a rich literature on ‘inter-locking livelihoods’, particularly concerning the role that rural–urban interaction and de-agrarianization have assumed in rural household economies (Kamete, 1998; Bryceson and Jamal, 1997). However, relatively little research has been undertaken on circular rural-to-rural population movements in West Africa, which remain a well established coping mechanism for poor households and individuals, and are not restricted to times of emergency or distress (McDowell and De Haan, 1997; Davies, 1996). The tendency to diversify portfolios is widespread in the Eastern Province of Sierra Leone, where actors pursue complex and dynamic livelihood strategies that involve the intertwining of the farming and mining economies. Furthermore, the Sierra Leone study reveals all three of the clusters of livelihood strategies suggested by Scoones (1998), namely agricultural intensification, livelihood diversification and migration. The ability of livelihoods to cope with and recover from shock is one of the defining elements of a sustainable livelihood, and evidence from this longitudinal investigation demonstrates that essential links between farming and mining have been maintained over time, despite the severe dislocation of the civil war years. In line with the sustainable livelihoods framework, the essential focus of this paper is on the resilience of this dual economy, and the diverse contributions generated by farming–mining links towards maintaining the sustainable livelihoods of poor households.

3. Diamond mining in Sierra Leone, past and present

Sierra Leone is generously endowed with a wide range of natural resources, and it seems inappropriate that the country has been relegated to the bottom of the world human development league table (UNDP, 2005). Indeed, there would appear to be great scope for improving levels of well-being, since the country is blessed with important mineral reserves, such as gold, bauxite and in particular, rutile. Of key significance however, are the rich diamond deposits, Sierra Leone’s most precious asset, which have

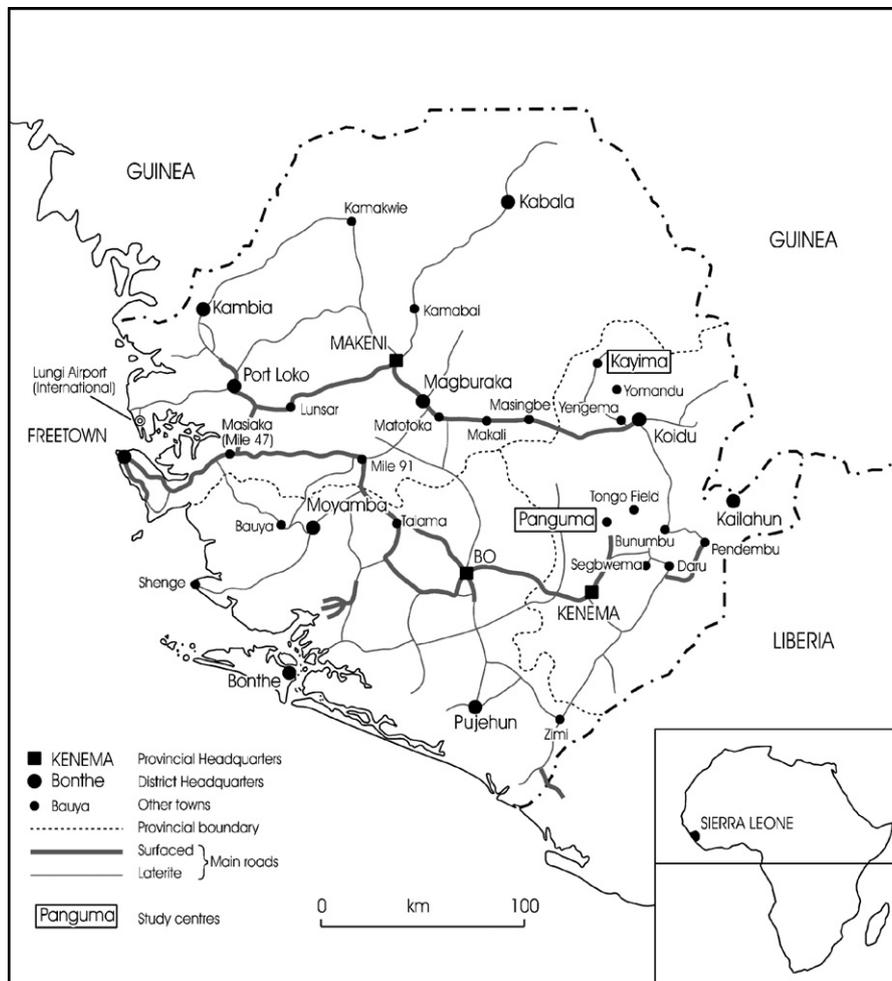


Fig. 2. Sierra Leone: main towns and communications.

been the country's major source of revenue since their discovery in the 1930s. During the period 1963–1975, the sale of industrial and gem diamonds represented about 60% of the country's export revenue, with the total value of diamond production peaking at £19.3 million in 1975 (Binns, 1982a). Sierra Leone's diamonds are found either in volcanic breccias occurring as diamondiferous dykes (frequently referred to as 'kimberlite pipes', because their blue clay-like appearance is similar to those found at Kimberley, South Africa), or are more commonly dispersed in the gravels of river beds and terraces. Two river systems, the Sewa and its tributaries, flowing through Kenema, Bo and Bonthe Districts, and the Moa, flowing through Kenema and Pujehun Districts, have deposited diamonds over large areas in the south and east of Sierra Leone (Fig. 2). In areal extent, the alluvial diamond mining fields cover almost 20,000 km², though the actual diamond-bearing alluvial ground is actually only about 200 km².

Unlike South Africa, where diamond mining is associated with the mechanical mining of deep reserves, in Sierra Leone it is not uncommon to find a good quality diamond on the ground surface, particularly after rain.

This 'accessibility' of diamonds led to a 'diamond rush' from the 1950s, which resulted in a massive influx of people into the Eastern Province. While it is both easy and economically practical for mining companies to strictly control deep kimberlite mining (as in Botswana or South Africa), in alluvial diamond fields, such as Sierra Leone, there are relatively few diamonds per hectare, people tend to actually live where the diamonds are, and labour-intensive mining techniques are more common. It is therefore virtually impossible to closely control alluvial diamond fields that are mined artisanally.

In recent years, considerable attention in Sierra Leone has been focused on the 'kimberlite process', as a possible way forward in breaking the link between the legitimate trade in diamonds and uncontrolled 'conflict' diamonds. In other African countries, including South Africa and Botswana, kimberlite deposits have been mined efficiently and profitably, using a secure, high-capital, high technology, low-labour mix. For example, a report compiled by the American consulting firm, Management Systems International (MSI) (2004), notes that in Botswana, Debswana produced a gross profit of US\$1.5 billion in

2001, employing only 6000 people, with virtually the entire production being exported legally.

There has been much international recognition of the potential of kimberlite mining in the effective management and marketing of diamonds, given the destabilizing effect that diamonds have had on many African countries. As such, in December 2000, the United Nations General Assembly adopted a resolution supporting the creation of an international certification scheme for rough diamonds. On November 5th, 2002, the scheme became known as the ‘Kimberley Process Certification Scheme’ (KPCS), and was adopted at a ministerial meeting in Interlaken, Switzerland. The Kimberley Process is a joint government, international diamond industry and civil society initiative to stem the flow of conflict diamonds onto the market, while at the same time protecting the legitimate diamond industry. The scheme was inaugurated on January 1st, 2003, and some 50 countries that are engaged in the production and trade of diamonds, including Sierra Leone, are now involved. Although a founding member of the KPCS, Sierra Leone had earlier in October 2000 initiated a certification scheme in accordance with UN Security Council Resolution 1306 (2000) of July 5th, 2000. This earlier scheme conforms to the KPCS and continues to be used in Sierra Leone. Since the introduction of the certification system in Sierra Leone, diamond exports through the Government Gold and Diamond Office (GGDO) have increased significantly as is indicated in Table 1.

As Table 1 clearly shows, there has been a significant increase in export earnings since the certification system was introduced in Sierra Leone in 2000, and kimberlite production has further increased the value of exports. However, most diamond mining in Sierra Leone is on a much smaller, local-level scale, and is ‘artisanal’ in nature, involving no more equipment than picks, shovels, buckets and sieves to ‘wash’ the gravel. Typically, between 20 and 100 miners will work together on small plots, digging gravel, transporting and washing it. Although superficially Sierra Leone’s artisanal mining activity might appear to be completely anarchic, there is in fact a tightly managed and highly ordered structure to production, and this local-level mining remains vital to both local and national economies. It is estimated that over 500,000 people currently depend

on the small-scale artisanal mining sector to derive their livelihoods, and the sector generates considerable revenue for the government (Ministry of Mineral Resources, 2005). It is significant to note that at this micro-level, the future potential of alluvial diamond mining in Sierra Leone is considerable. Research undertaken in the Eastern Province during the 1970s, and before the war, suggested that if diamond capital was reinvested into the local economy, it could provide the necessary catalyst for rural development (Binns, 1981).

In the mid-1970s, the commonly held view was that artisanal diamond mining was having detrimental effects on Sierra Leone’s rural economy, in drawing productive young males away from farming, affecting the achievement of self-sufficiency in basic foodstuffs, and in destroying large areas of good farmland in the frantic search for diamonds (Binns, 1982a). Migration from both within Sierra Leone and also across the porous Guinea and Liberia borders had the much-reported effects of reducing domestic food production in the 1950s and 1960s, with the loss of farm labour, and also generated serious security problems in burgeoning towns such as Koidu. Moreover, during the years of the All People’s Congress (APC) regime under Siaka Stevens (1968–1985), a patrimonial system of patron–client linkages developed, the state intervened in the national economy, and by manipulating exchange mechanisms and propping up an over-valued currency, was able to ensure a continuous flow of cheap imported rice (the main staple) into the diamondiferous regions and urban areas. Richards (1996, p. 51) remarks, “Only had there been a steady policy to support local producers over the years, with the attendant risk of politically expensive rice shortages in the diamond districts and urban areas while the system adjusted, would the necessary in-country purchasing, transportation and milling infrastructure have emerged”.

Between 1963 and 1974, the population of Koidu, at the heart of the diamond mining area, mushroomed from 14,309 to 75,600, such that by 1974 it had overtaken Bo as the country’s second largest urban centre after Freetown (Binns, 1982a). In the early 1970s, diamond mining activities could be broadly divided into three types. First, the National Diamond Mining Company (NDMC) had the exclusive right to mine in two lease areas at Yengema (Kono District) and Tongo Field (Kenema District). Elsewhere, indigenous Sierra Leoneans could apply for mining licences under the Alluvial Diamond Mining Scheme (ADMS), created in 1955. A third type of mining activity was ‘illicit mining’, where individuals and groups mined illegally in the company lease areas, or undertook unlicensed mining in ADMS designated areas. At its peak in 1957, an estimated 37,500 were mining under licence through the ADMS, but it was difficult to estimate numbers of illicit miners, since these fluctuated both temporally and spatially, according to such factors as the accessibility of diamondiferous gravels and the strength and vigilance of the NDMC security force (Binns, 1981, p. 153).

Table 1
Diamond exports in Sierra Leone 1998–2004 (GGDO)

Year	Carats	Value (US\$)	3% Duty
1998	15,818.04	1,780,287.41	53,408.22
1999	9,320.32	1,244,825.34	37,344.76
2000	77,372.39	10,066,920.81	302,007.62
2001	222,519.83	26,022,492.27	780,674.77
2002	341,859.23	41,732,130.29	1,251,964.71
2003	506,723.37	75,969,753.32	2,193,335.84
2004(+)	499,242.43 (A)	89,618,053.54	2,638,541.07
2004(+)	58,030.54 (K)	11,172,434.79	624,489.30

(+) Figures up to September 2004, (A) Alluvial, (K) Kimberlite.

Source: Strasser-King (2004, p. 9).

4. Farming miners or mining farmers?

In exploring the nexus between diamonds and agriculture, a number of researchers have traced the contours of Sierra Leone's agrarian decline during the APC years (1968–1991) at a macro-level, suggesting that the government became locked into a cycle of dependency on diamonds and imported white rice (for example, see Zack-Williams, 1995; Richards, 1996). However, comparatively little academic attention has been directed towards understanding how small-scale producers have responded to the demand for food at the micro-level, particularly in the diamond mining areas themselves, where a number of suitable incentives may have actually been present. For many years, entrepreneurial farmers in the Eastern Province have maintained strong links with those operating in the diamond mining sector, and such relationships have become an important component of livelihood portfolios. The literature on livelihood diversification identifies a wide range of factors that help to explain why diversification occurs and how patterns of diversification are shaped (see Ellis, 1998 for a good review of the literature). One such factor, seasonality, remains an important determinant in understanding the circular migration patterns that define the 'interlocking nature' of mining and farming.

An important feature that was apparent in the 1970s, was that the graph of monthly ADMS licence issues related very closely to the cycle of food production on the upland rice farm, the dominant food production system in the Eastern Province of Sierra Leone (Binns, 1982a). Whilst diamond mining is almost entirely undertaken by men, traditional farming activities are divided between men and women according to different tasks undertaken at various points in the cultivation cycle. The peak period for licence issues in the 1970s was between January and March, which corresponds with the dry season and the preparation of the upland farm for cultivation. This involves the clearing of undergrowth, felling of trees and the burning of debris, jobs traditionally performed by men. Although farm preparation may be difficult, there are times, notably whilst the cleared vegetation is drying, when farmers can afford to spend some time away from their farms and may undertake diamond mining, either licensed or illicit. During April, a time which coincides with the burning of farm debris, sowing seed and hoeing the farm, the issue rate of ADMS mining licences in the early 1970s declined. This is the beginning of a busy period on the farm, which increases in intensity at the height of the rains in July and August, when fencing and weeding must be done in earnest. Most part-time miners will spend this period attending to their farms, growing foodstuffs for their families and possibly selling surpluses to the mining population in towns such as Koidu.

From late September until well into November, the rice crop is being harvested and most men will play a key role in this important economic and social event. In the latter part of the year, as harvesting is completed, mining may once

again become more important and the number of licenses issued increased. It was therefore apparent in the early 1970s that diamond mining and farming activities 'dove-tailed', with mining being undertaken in the dry season when river levels are low, whilst farming was the dominant activity during the rainy season. Any perturbations in the farming cycle, such as late rains or incomplete burning, could have the effect of reducing the involvement in diamond mining activities of those with farming responsibilities. In farming communities located close to the main diamond mining areas, there was a regular circulation of labour between farming and mining activities.

Fieldwork undertaken in and around the diamond mining areas in the 1970s, suggested that the stereotypical view of a negative impact of diamond mining on farming was in fact far from the truth. On the contrary, many people were actively working and investing in both food and export crop production (Binns, 1982b). In striving to achieve sustainable livelihoods, individuals and households utilized different types of capital in a variable portfolio of productive activities. The two communities studied in the 1970s, Kayima and Panguma, are situated in the Eastern Province some 250 km from Freetown and less than 100 km from the Guinea and Liberian borders (Fig. 2), and both are within easy reach of the diamond mining areas. Moreover, both communities were producing large quantities of food crops for sale to the mining population, and were reinvesting their earnings in homes, families and, most notably, in the expansion of cash crops such as coffee, cocoa and citrus fruits (Binns, 1982b). Whilst many farmers were producing considerable amounts of surplus rice to sell in the mining area markets (Rosen, 1974), the greatest response in terms of food production system changes occurred with fruit and vegetable crops, most notably cassava and citrus fruits, which were increasingly grown for sale to the mining population.

Whilst in the early years of the diamond mining boom in the 1950s and 1960s, and also in the heavily degraded 'heartland' of the mining areas, there were undoubtedly detrimental effects on agriculture, by the early 1970s farmers had effectively adapted their farming systems and were increasingly gearing production strategies towards satisfying commodity demands from diamond area markets. In fact, Riddell has shown that, unlike other parts of West Africa, periodic markets in Sierra Leone were relatively slow to develop, being stimulated into existence by growing urban centres, associated with diamond mining (Riddell, 1974). For example, the large fortnightly market at Tokpombu outside the NDMC mining camp in Tongo Field, was specifically initiated in 1970 by the local paramount chief, to supply food and consumer goods to the growing mining population, and was commonly known as 'Pay Friday Market', since it coincided with the days when NDMC staff were paid (Binns, 1982a). Riddell suggested that these periodic markets were both 'critical' and 'innovative', placing, "...a stimulus for commercial crop production near the farmer, for the first time in

many areas, and they may commercialize an essentially subsistence system of agriculture” (Riddell, 1974, pp. 547–548).

In summary, research conducted in Kayima (Sandor Chiefdom) and Panguma (Lower Bambara Chiefdom) in 1974 and 1978, suggested that although the diamond boom probably had some detrimental effects on food production in the early years of mass participation, many farmers actually seemed well aware of the increasing demand for foodstuffs, and progressively innovated in their production strategies towards satisfying this demand (Binns, 1981; Rosen, 1974). Now, in the early 21st century, it seems that, superficially at least, a great deal has changed between the 1970s and the present post-conflict period. But recent field-based research between 2002 and 2005, carried out again in Kayima, now a town of some 2000 inhabitants, and Panguma with 5000 inhabitants, suggests that rather surprisingly, many of the links between farming and diamond mining have actually been maintained, despite severe dislocation during the war. Both towns are located, respectively, within easy reach of the Yengema and Tongo Field diamond mining areas, a region which was one of the hardest hit during the conflict and remains vulnerable. Extensive household questionnaire surveys, focus group discussions and in-depth interviews with farmers from both towns, and miners working in the nearby diamond fields, suggest that these links could play a key role in the rejuvenation of market-oriented food production, providing the much needed impetus for post-war rural development.

Between May and July 2004, 50 households in Kayima and 50 households in Panguma were randomly sampled, and semi-structured interviews were conducted with a broad cross-section of the community. Discussions specifically focused on issues concerning the relationship between alluvial diamond mining, agriculture, and rural development. Many of the questions originally asked in the 1970s research were re-visited, giving the study a valuable 30-year longitudinal perspective. The interview schedule revolved around questions which explored local efforts to rebuild farming-based livelihoods, examined how surplus farm crops were being marketed and the income used in community reconstruction, and investigated the effects of diamond mining on farmers’ production and marketing activities. When residents’ responses were compared with interview transcripts from the 1970s, there were some striking similarities.

One key difference between the two sample populations interviewed, was that those who participated in the more recent study were post-conflict returnees, who were still in the process of trying to re-establish their war-torn lives. During the research conducted in the 1970s, most of the 100 farmers interviewed in Panguma and Kayima were either well-established natives of those towns, or Lower Bambara and Sandor Chiefdoms respectively. In the recent research, most interviewees had recently returned from their war-time areas of displacement, and many were still

engaged in ‘bringing family members home’ from locations elsewhere in Sierra Leone or neighbouring Guinea.⁵

A field-based survey and mapping exercise carried out by the researchers in both communities between May and July in 2004 revealed that the level of community destruction resulting from the war was massive. In both settlements, the RUF destroyed many houses, as well as bridges, schools and hospitals, markets, court barriers (community halls), water pipes, and in the case of Panguma, the electricity supply and sawmills. At several times during the conflict, both communities had to be completely evacuated, with widespread migration to Freetown, which was relatively safe and received supplies from organizations such as UNHCR. Although residents have been steadily returning for over two years now, housing is still a major problem. The mapping exercise in May–June 2004 revealed that in Kayima, there were only 185 inhabited houses, whilst Panguma had 354 inhabited houses. The proportion of demolished buildings was 34% in Kayima and 32% in Panguma, but vandalism was widespread and indiscriminate during the RUF incursions, such that very few buildings actually survived unscathed.

In the post-conflict situation, when questioned about present-day links that existed between the diamond mining and farming economies, residents of both Panguma and Kayima believed overwhelmingly that the most important relationship between the two concerned the profitable sale of foodstuffs to miners. In Panguma, this key link was mentioned by 94% of households sampled, while in Kayima, 88% of households believed this to be true. Although a substantial portion of respondents admitted that they did not personally sell produce to miners, it seems that mining ‘boss men’ came to both communities to purchase bulk supplies of foodstuffs for their work gangs, as is illustrated by the following comments from one farmer in Kayima:

It is much cheaper to buy produce in Kayima than in Koidu or Yengema. A boss man who has miners working for him is responsible for feeding them all. He will maximize his profits if he can reduce his overhead costs and buy the food at a cheaper cost here. He may also, of course, re-sell some of that food in the diamond areas for a higher price (Komba, 2004).

Indeed, surveys undertaken among farmers in both communities confirmed that average prices obtained for produce sold in the mining areas were significantly higher than prices at the local market. However, it was also revealed that poor road connectivity remains a major barrier to farmers wishing to sell food surpluses to markets outside their communities.

The significance of road transport in rural marketing and development has been considered in considerable detail

⁵For a more comprehensive discussion of the challenges faced by war-time refugees returning ‘home’ in post-conflict Sierra Leone, see Binns and Maconachie (2005).

elsewhere. During the 1970s, the integration of feeder road construction with agricultural improvements was a feature of many of Integrated Rural Development Schemes. As Blaikie et al. (1977, p. 4) suggested many years ago, rural planners inspired by Rostowian discourses of modernization have largely believed that “roads plus expenditure on agricultural extension...equals development.” More recently, Porter’s (1995) research conducted in northern Nigeria has highlighted how rural mobility issues are embedded in the development nexus in far-reaching and complex ways. Her study demonstrates how road construction can play an instrumental role in the reorganization of regional marketing systems and trader patterns, often having disastrous consequences for rural women living in off-road communities. Porter’s (2002) study in Ghana shows how those living ‘off-road’ not only suffer in terms of poor rural service delivery and market isolation, but are also marginalized in terms of power relationships, particularly with respect to having access to the political processes associated with decentralization policies. As Chambers (1988, p. 3) has also cautioned, ‘core invasions’, such as the extension of roads and infrastructure into remote rural areas, can have mixed effects since livelihoods are both generated and destroyed at the same time.

Many feeder road impact studies have envisaged that improved accessibility will stimulate the increased production of cash crops by farmers (Pirie, 1993). However, Airey’s (1985) study into the role of feeder roads in promoting rural change in Sierra Leone’s Eastern Province, revealed that there remains a real danger that such externally dependent change may not be self-sustaining. Long before the civil war, the feeder roads built in the 1970s were deteriorating rapidly. Airey notes that without sufficient community participation and better institutional commitment, a viable road maintenance programme is simply not possible. Ultimately, his study argued that ‘low cost tracks’ may in fact be a better economic use of scarce resources, and at the same time may be more appropriate to the developmental state of the rural economy in isolated regions of the country.

While there remains some debate as to the exact contribution that road construction and rehabilitation might make in raising living standards in Sierra Leone, improved population mobility has long been seen as vital for strengthening links between farmers and miners (Mills, 1973). In the Eastern Province, it appears that some progress has been made on road and bridge reconstruction over the last two years. For example, on the road linking Kayima to the market town and diamond mining centre of Koidu, some 40 km to the south-east, there is currently a major European Union funded road rehabilitation project in progress. As a result, some entrepreneurial individuals in Kayima have recommenced the cultivation of cash crops, such as coffee, cocoa and citrus fruits that were popular in the 1970s. However, the high transportation costs between Kayima and Koidu remain a major obstacle for many farmers, which has militated against investment in export-

or cash-crop production. As one farmer commented in May 2003:

I would like to start growing more coffee again, but the cost of transporting it to Koidu is still too high. It costs 14,000 Leones (c. £3.85) to transport just a very small load there, such as one five-gallon drum of palm oil. The cost of taking the coffee there would be much too high, and the price I am paid for my crop fluctuates, so I am never sure if I will do well or not. I may get as much as 500 Leones (c. £0.14) per pound in Koidu, but at least in Kayima I know that the traders will pay between 200 and 300 (Leones per pound). It’s better to sell to the trader for less, and not have to worry about the transport and uncertainty (Lamina, 2003).⁶

In Panguma, the situation was slightly different, because transport links between the community and the mining areas were much better and distances shorter. One group of women in Panguma reported that in an attempt to re-establish links between the farming and mining economies, they were actually head-loading vegetables from Panguma to Tongo Field, a round trip of some 15 km. Most women believed that the price differentials in food sales at the two locations were significant enough to justify the increased workload involved in transporting produce (see Table 2). However, discussions also revealed that this additional work had exacerbated their health problems. Not only are women facing increased reproductive workloads in the domestic sphere, but their productive responsibilities have also increased, since many are engaging in income-earning activities elsewhere to re-invest in the local economy.

Echoing these findings, research conducted in the 1970s revealed that one of the great attractions to farmers with surplus produce to sell, was the high prices that people were prepared to pay in the mining areas. A survey undertaken in 1965/1966 revealed that rice prices were much higher in the three districts of the Eastern Province than elsewhere in Sierra Leone—ranging from 42% to 55% above the national average (Mutti et al., 1968). A similar trend was noted in the prices of other basic foodstuffs, such as palm oil and groundnuts. Binns (1981, p. 185) comments:

Increasingly, demands for foodstuffs in the mining areas have resulted in the growth of a large and varied group of itinerant traders, who earn a living by purchasing surplus crops and transporting them to the mining area markets for sale, often at substantial profit. These traders, many of whom are women, have developed a vast and highly organised network for the marketing of food crops, and have been greatly assisted by improvements in the transport network and the increased volume of traffic. The itinerant trader prospers by establishing personal contacts with producers in the

⁶Exchange rate for May 2003: £1 = Le 3085.260 (Source:OANDA.com (Interbank rates)).

Table 2
Prices of selected foodstuffs in Panguma and Tongo Field

Food Crop	Panguma	Tongo Field
Palm oil (5 L drum)	Le 48,000 (c.£10.72)	Le 52,000 (c.£11.62)
Peppers (1 standard measure rubber pan)	Le 1,500 (c.£0.34)	Le 2,000 (c.£0.45)
Beans (1 cup)	Le 200 (c.£0.05)	Le 250 (c.£0.6)
Pineapple (1 small)	Le 300 (c.£0.07)	Le 600 (c.£0.13)

Source: Authors' survey, July 2004.

Notes: Exchange rate for July 2004: £1 = Le 4475.970 (Source: OANDA.com (Interbank rates))

remotest of villages, and sometimes offers incentives in the form of credit, in return for guarantee of crop purchase at harvest time.

When asked if the amount of business being carried out between miners and farmers had changed between the pre-war and post-war periods, the opinion was divided between the two research sites. In Panguma, more interviewees believed that trade links between farmers and miners were now stronger than before the war—38% believed that trade links were stronger before the war, compared with 40% who believed links were stronger after the war. However, in Kayima, the perception was that trade links were much stronger before the war than they are now—60% believed pre-war links to be stronger, while 34% believed present-day links to be stronger. The main reason given for the post-war deterioration in trade links between Kayima and the mining areas was the poor state of the roads. Other factors mentioned included a weak economy, inflation, the devaluation of the Leone, and increased rural joblessness.

The other main link between diamonds and agriculture that was reported to have remained largely unchanged since the 1970s was the strong nexus of seasonal work between farming and mining and the associated population mobility. In Panguma, 42% of households surveyed conceded that there was at least one household member who engaged in seasonal mining work after the farm work was completed. While some (14%) believed that this link was positive and allowed farmers to reinvest diamond income into their farms, a higher percentage of respondents (38%) demonstrated concern that farm labour had been drastically reduced since youths were being drawn away from agriculture, preferring to be full-time miners.

In Kayima, although more distant than Panguma from the mining areas, an impressive 78% of those interviewed admitted that either themselves or one of their family members were part-time miners during the dry season, and 46% believed that the number of youths who are now seasonal miners had increased since before the war. There were a number of explanations for this phenomenon. Most importantly, it was recognized that there was a desperate need for financial capital to repair houses, with many speaking of a serious 'housing crisis'.

It was also generally understood that the depressed rural economy and high level of joblessness in Kayima meant

that it was difficult to obtain this much-needed income from agriculture. Agricultural yields were reported to be lower than before the war due to a number of constraints, and it was felt that 'lost' income had to be recovered in other ways to make ends meet. Many respondents felt that diamond mining offered the only hope for financing the reconstruction of their livelihoods. It was also acknowledged that certain cultural changes had taken place since the war, which had increased mobility within the rural areas. For example, youths became more accustomed to moving about during the war and a 'culture of mobility' had developed. In addition, it was reported that a rift had developed between youths and community elders, such that many youths no longer felt any allegiance to the chiefs.⁷

In Kayima, 40% of those interviewed believed they were benefiting from diamond mining either directly or indirectly. Within this group, 12% noted that miners created an important market to sell their produce, and 8% pointed out that this was a vital part of their livelihood portfolio, as they could not meet all their needs from farming alone. Alternatively, 36% believed mining to be 'a gamble', and 10% stated that mining had deprived their family of farm labour. A further 8% of the sample conceded that mining was destroying valuable farmland.

In Panguma, 36% acknowledged that they were in some way personally benefiting from mining, with 16% admitting that miners were a key market for their produce. A further 4% said that they had used money derived from the mining industry to develop their farms. Of those who were sceptical about mining, 26% referred to diamonds as being 'a gamble', 10% noted that farm labour was being lost to the mining areas, and 14% said that their farmlands had been degraded by miners.

5. Diamonds for development?

Although some observers remain sceptical about the future role that diamonds will play in the development of Sierra Leone's rural economy, evidence from recent research suggests that diamond mining in the Eastern Province may continue to serve as a catalyst in the form of markets and capital, to rejuvenate food production in the region. Indeed, there is a strong indication that many of the

⁷See Peters et al. (2003) for a more detailed discussion of the division that has ensued between youths and elders in post-conflict Sierra Leone.

complex links between the farming and mining sectors have endured, despite a period of severe dislocation during the civil war. However, more broadly, the potential for diamond revenue to provide the impetus for post-conflict rural development is considerable. But ensuring that the benefits of diamonds are actually returned to the communities from which they are mined remains a great challenge for the future. The next section of the paper explores the potential of community-directed diamond mining in providing Sierra Leone with a viable strategy for development.

Focus group discussions in Kayima and Panguma in November 2002, May 2003 and January 2004, revealed that many local residents regarded the presence of diamonds in the area as a ‘double-edged sword’, in line with the ‘resource curse’ concept that was considered earlier in this paper.⁸ Many respondents believed that diamonds had been a prime cause of the war, and that the significant illegal trade and export of diamonds was largely responsible for financing and perpetuating the conflict.⁹ At the same time, others demonstrated much optimism that the revival of the mining sector could serve as one of the main sources of economic growth and poverty alleviation in the region, and many perceived diamonds as ‘the great hope for a better future’.

Whereas in the 1970s, the mechanized NDMC operations at Yengema and Tongo Field, together with the ADMS which operated in other diamondiferous areas, were by no means perfect arrangements for exploiting the valuable resource, the present post-war situation appears to be chaotic, with much reported illegal mining and smuggling of diamonds across international borders. In fact, it has been estimated that up to 90% of the country’s diamond production in 2002 was exported illegally, amounting to over US\$350–\$400 million in lost development funding and potential fodder for money laundering (MSI, 2004). The urgent implementation of an effective management scheme for monitoring the mining and marketing of diamonds would seem imperative, given the potentially destabilizing effect on the country of the uncontrolled exploitation of this important resource. A recent report by Management Systems International gives cause for concern, noting that, “Only a tiny proportion of the value on the European market value of the exports (approximately 10–15%) remains to be split among

200,000–400,000 miners and diggers. These 15–30 year-old males are the very demographic group that is most likely to resume warfare if left unattended” (MSI, 2004, p. 7).

The economic activity generated by investment in the mining industry has been well documented, especially the linkages created in terms of indirect employment, increased trading, demand for goods, and the conversion of generated income to consumption at the local and national level (Brima, 2004). However, recent discussions with management executives at a number of international mining companies operating in Sierra Leone reveal that it is becoming increasingly common for company-funded development initiatives to be included in negotiations for mining licences as ‘conditionalities’. For example, since 2003, Koidu Holdings (originally Branch Energy Ltd., a subsidiary of Canada’s DiamondWorks), has started mining the kimberlite in Kono District, where its holdings are estimated to be worth up to US\$2 billion. The company has agreed that once full-scale operations are in progress, funds will be invested in the local community to build a clinic, skills training facilities and a primary school. Another company, African Gold and Diamonds (SL) Ltd., a joint South African/UK venture, currently employs some 370 local people in its operations, and has recently rehabilitated the war-damaged secondary school at Tefeya, where more than 400 children are enrolled. Furthermore, before operations commenced, the same company built a much-needed bridge across the Bafi River at Bendukunda¹⁰ (Quiwa, 2005). A third company, Sandor Development Corporation, plans to construct a health clinic at Bagbema once production begins to pay off, and is currently involved in negotiations with the Minister of Agriculture to develop cattle ranching operations on the mined out sites that it rehabilitates (Petzner, 2005).

A portion of the government’s 3% diamond export tax (which amounts to 0.75% export duty) is also being put into the Diamond Area Community Development Fund (DACDF) for small-scale development in diamond communities (Inter Press Service, 2004). The first tranche was made for the period January–June 2001, and disbursements have been made every six months since then. Chiefdoms benefit in accordance with the number of mining licences issued and the value of stones recovered from the area. Funds disbursed are used for community development projects and, according to the Ministry of Mineral Resources (2004), as of December 2003, Sandor Chiefdom had been allocated Le 96,586,460 (c. £29,074) by the DACDF and Lower Bambara had received Le 112,363,124 (c. £33,833)¹¹. In Kayima, the fund has financed the rehabilitation of the Native Administration (NA) police

⁸Other observers have noted that decades of diamond smuggling in Sierra Leone have contributed to the rampant corruption of the government, most likely played a key role in funding the civil war, deprived the country of millions of dollars in development funds, exacerbated instability in the West African sub-region, and distorted Sierra Leoneans’ basic sense of governance. More recently, and particularly since September 11th 2001, the international community has become increasingly aware that the illicit diamond trade provides an effective vehicle for international money laundering, and is a potential source of resources to be utilized by terrorist groups (see Even-Zohar, 2003).

⁹Household surveys conducted between May and July 2004 further indicated that in Panguma, 20% of those surveyed believed that, ‘diamonds had caused the war’ while in Kayima, 14% of the sample population believed this to be so.

¹⁰Discussions with company management revealed that although the cost of the bridge was originally estimated to be US\$150,000, the overall cost of the project was ultimately considerably more, possibly as high as US\$600,000 (Quiwa, 2005).

¹¹Exchange rate for December 2003: £1 = Le 3322.110 (Source:OAN-DA.com (Interbank rates)).

quarters and lock-up, and the community health centre. In Panguma, the fund has been used for the rehabilitation and extension of the community centre. In addition to providing much needed resources for development, the fund is (in theory) supposed to encourage chiefdoms to effectively monitor mining and eradicate illegal activities, thereby enhancing the certification system.¹²

Progress was also made in December 2002, when USAID launched the Kono Peace Diamond Alliance to improve the management capacity of the diamond resources and to ensure that more benefits from mining and diamond sales flow back to local communities. USAID argue that this initiative “is also an attempt to prove to Sierra Leoneans and the world that words often associated with Sierra Leone’s diamond industry in the past—exploitation, corruption, abuse and conflict—do not necessarily have to be features of its future” (USAID, 2003).

Although the majority of returnees interviewed in Kayima and Panguma expressed great distrust of NGOs and their ‘hollow’ promises, it would appear that the Alliance has demonstrated the determination and political will needed to erase the chequered history associated with diamonds. Various local, national and international organizations are part of the Alliance. For example, local Kono-based organizations agreed to establish a dealers’ cooperative and an ‘information outreach hub’ to ensure that important information reaches every village. They also agreed to monitor legal and illegal diamond dealings and to initiate environmental programmes to rehabilitate mined-out land for agriculture.¹³ Meanwhile, the Government of Sierra Leone has promised to improve the operation of the DACDF and to launch a public awareness programme on corruption. De Beers has agreed to train Sierra Leoneans as diamond valuers, whilst the kimberlite mining company, Koidu Holdings, is committed to financing the training of local people in agricultural skills. A number of NGOs are also involved in the Alliance, such as Catholic Relief Services, which aims to assist chiefdoms in establishing transparent decision-making to decide on how to allocate proceeds from the DACDF.

¹²A report by MSI (2004, p. 5) observes that the DACDF Coalition—a union of representatives from the Ministry of Mineral Resources, Ministry of Local Government, national and international NGOs, the Anti-Corruption Commission and the Miners’ Union—is working with traditional leaders in diamondiferous chiefdoms to help chiefs improve their responsiveness to community interests and accountability for funds. The report notes, “Constant sensitization, reporting on misspending, and refusal by central government to accept mismanagement of DACDF funds, has resulted in a remarkable turnaround in fiscal responsibility. Whereas fully 60% of the first tranche of DACDF funds disappeared, by the most recent tranche almost 90% of all funds were accounted for—including recovery of some of those funds missing initially” (MSI, 2004, p. 4).

¹³Virtually no environmental reclamation of mining sites for other uses has been practiced in recent history, often leaving the land unusable for agriculture (MSI, 2004, p. 6). Field research undertaken in the 1970s revealed much local concern in Eastern Province communities regarding NDMC’s failure to rehabilitate mined land and return it to farming (Binns, 1981).

6. The Peace Diamond Alliance

In this final section of the paper, attention is focused more specifically on the ‘integrated diamond management approach’ adopted by the Peace Diamond Alliance, which attempts to recognize the multi-faceted nature of the problems associated with Sierra Leone’s diamond industry. The integrated credit and alluvial diamond mining tracking system developed by the Alliance is grounded in providing better prices to miners and their labourers, and builds on both the Kimberley Process and the work that the United States Agency for International Development (USAID), Management Systems International (MSI), the Government of Sierra Leone (GOSL), and various other donors have undertaken in Sierra Leone’s diamond sector since 1999.

An essential first step in preventing diamonds from being smuggled out of the country, and ensuring that more of the resource is harnessed for community development, is to create a better management scheme for both their mining and marketing. While the Kimberley Process is a crucial step in this procedure, it has been described by critics as being too far ‘downstream’ to be effective on its own (MSI, 2004, p. 8).¹⁴ In short, the integrated management scheme developed by the Alliance involves a rigorous ‘paper trail’, from the point when a diamond is first identified, to the point when it leaves the country—what is referred to as the ‘Earth to Export’ tracking scheme. A recent report notes (MSI, 2004, p. 8):

...the opaque diamond industry will not willingly adopt a system based on transparency, unless it is in their interest to do so. Miners want the higher prices that the Earth to Export can give, but are ‘debt bound’ through the existing support arrangements. We need to link the Earth to Export scheme to financing schemes that promote Earth to Export and more competitive buying.

A core component of the integrated approach also involves the development of mining co-operatives. By organizing miners into groups of 50 persons, co-operatives play a role in addressing the problems of equity, by improving benefits to the ordinary diggers, creating transparency in mining, promoting realistic trading agreements in the industry, enhancing realistic prices for winnings and promoting wealth creation. Working through such co-operatives, the Alliance seeks to maximize benefits to local miners, diggers

¹⁴It is important to note that while the Kimberley Process is a crucial international initiative, it is not sufficient to curb smuggling completely (see Strasser-King, 2004 for a more comprehensive discussion of some of the concerns about the Kimberley Process). As such, some critics speak of the need for a ‘Kimberley II Process’, to address local issues that encourage smuggling and impede enforcement. The Peace Diamond Alliance continues to lay the foundations for such an initiative, which is consistent with one of the key objectives stated at a recent *Kimberley Lessons Learned Conference*, to develop what were referred to as ‘Development Diamonds’ (MSI, 2004, p. 2).

and their communities, while at the same time minimizing corruption, and mobilizing local surveillance and mines monitoring. The scheme ultimately aims to increase community participation in diamond management, enhance government capacity, and reform diamond policy.

The Alliance's integrated management approach is community based, and builds upon reform initiatives such as the Diamond Area Community Development Fund (DACDF). An Executive Committee guides all activities and serves as a local forum for the discussion of a wide range of diamond management issues on behalf of its constituent members. Although originally established in Koidu, operations have now expanded to Tongo Field, utilizing and strengthening local institutions as far as possible. It is envisaged that lessons learned from the project will be applied elsewhere in Sierra Leone, and possibly in other countries with similar alluvial mining scenarios, such as Angola, the Democratic Republic of Congo and Guinea.

Of great significance to the current discussion, is that one of the aims of the Alliance, as stated in a recent mission statement, is "to encourage the development of economic alternatives to mining" (PDA, 2005). Although not presently part of the initiative, recent discussions with the Alliance indicate that there is considerable interest in integrating local agricultural and mining systems in project activities (Sandi, 2005). Depending on the timing and release of funds, future initiatives would encourage farming communities to scale-up their production to cater for the food demands of those mining. A recent report notes:

A mining team of 30 people will use one bag of rice daily. This is a ready, and yet untapped, rural livelihood stimulant, as currently almost all rice used in mining is imported. It increases the family budget and brings benefits to women through agriculture from a predominantly male-driven industry (MSI, 2004, p. 25).

The Alliance recognizes that there is great potential for strengthening existing links between farming and mining sectors and reinforcing the 'inter-locking livelihoods' concept that is a longstanding feature of farming–mining relationships in Sierra Leone's Eastern Province. Future development strategies must be based on a detailed understanding of relationships between the agricultural and mining sectors if meaningful rural development is to be achieved among desperately poor communities. Ultimately, an understanding of the complex patterns and processes in this rapidly changing situation could assist planners in preparing for the time when diamond production ceases and large numbers of displaced persons must be absorbed into other sectors, principally small-scale farming.

7. Conclusion

In the past, diamond mining was invariably perceived as having wholly negative effects on Sierra Leone's food

production and rural economy. Remarkably little research has been directed towards understanding the linkages between the small farm sector and the formal and informal sectors in the mining continuum. A notable exception to this was the work undertaken by Binns in the 1970s, which has been re-visited in this paper. The two rural communities in the Eastern Province that were the focus of this earlier research have once again been the focus of study in the post-conflict period, revealing the current perceptions and behaviour of farmers and community members. Such longitudinal studies are all too rare in Sub-Saharan Africa. This recent research has revealed that, as in the 1970s (Binns, 1981), most farmers are responding spontaneously and rationally to the demand for food from the mining population. Such links between the rural and mining economies are crucial to maintaining sustainable livelihoods, and could well play a pivotal role in rebuilding the rural economy. While the continued integration of agricultural and mining systems would seem to be an integral step in rebuilding rural livelihoods and improving food security, the social and environmental impacts of this relationship also need to be acknowledged and addressed.

This paper has focused principally on the social aspects of these linkages, but other observers have indicated that the environmental impacts of mining on farmland also require urgent attention. In areas where long-term artisanal mining has been prevalent, the landscape has often been stripped of vegetation and top soil, resulting in the loss of much good agricultural land (Turay, 2003). However, some encouraging examples of reclamation initiatives do exist, such as those reported by MSI (2004, p. 13), where local residents living on the outskirts of Koidu have levelled mining tailings and are now successfully cultivating vegetables. According to the MSI report, such evidence suggests that annual flooding may replace nutrients necessary to sustain small-scale agriculture. Further research on the environmental impacts of diamond mining is necessary.

Recent research, in building upon earlier work in the 1970s, suggests that the complex relationships between mining and farming could play an important role in stimulating market-oriented food production, which in turn could lead to the economic upliftment of communities which were devastated during the war. We have seen how stocks of human and social capital in Kayima and Panguma have proved remarkably resilient despite the turmoil of the last decade. With the steady improvement of the road network and attention to the reclamation of mined areas, it seems that the natural and physical capital stock will be progressively strengthened. But, probably of greatest significance in the reconstruction phase, is the economic incentive provided by buoyant food demands from the mining population. This could significantly strengthen economic capital among rural producers, and it is arguably this element in the sustainable livelihoods 'package' that has been most severely affected during the conflict period. This research has demonstrated that

clusters of livelihood strategies, as identified by Scoones (1998), do exist, such that agricultural intensification, livelihood diversification and migration are clear manifestations of the intricate relationships between farming and mining.

A significant element in further strengthening the sustainability of rural livelihoods will be the introduction of an effective, and in itself sustainable, scheme for controlling the mining and marketing of diamonds, which could lead to the channelling of a greater proportion of the benefits towards impoverished and vulnerable communities. Ensuring that Sierra Leone's diamonds are exploited in a more economically and environmentally sustainable manner, with more benefits accruing to the communities where they are mined, remains one of the greatest challenges ahead.

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