

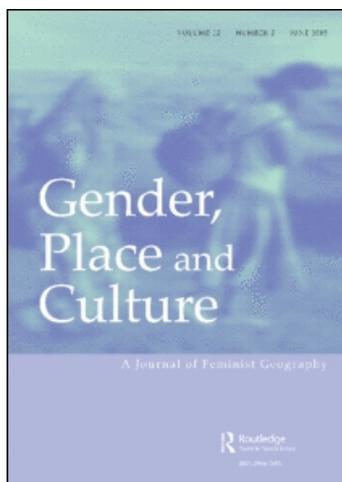
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Kuntala Lahiri-Dutt^a

^a Resource Management in the Asia Pacific Program, Research School of Pacific and Asian Studies, The Australian National University, Canberra, Australia

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Digging women: towards a new agenda for feminist critiques of mining

Kuntala Lahiri-Dutt*

*Resource Management in the Asia Pacific Program, Research School of Pacific and Asian Studies,
The Australian National University, ACT 0200 Canberra, Australia*

This article addresses how a contemporary feminist perspective can problematise the ancient human endeavour of mining, and indicates which direction research on the interface between extractive industries and gender could usefully take. Feminist research has confronted masculinist discourses of mining by questioning the naturalisation of men as industrial workers, and by illustrating the gender-selective impacts of capitalist mining projects. The article probes the sources of these masculinist discourses of mining and reinterprets these critiques. Most importantly, by highlighting the diverse range of extractive practices that reflect different stages of surplus accumulation, it encourages a rethinking of mining itself as an area of feminine work. Finally, it makes tentative suggestions as to how the field of women and mining might be examined and addressed by contemporary feminists. A postcapitalist feminist critique of mining would hinge upon revealing women's agency in mining and revisit the conventional definitions of mining as industrial work and begin to see the feminine livelihoods in mining.

Keywords: informal mining; gender; women; representations; mining technology; mining impacts

Feminist critiques of mining

Mining, an ancient human activity, has a 'troubled' history (Lynch 2002) and a problematic relationship with economic development (Graulau 2008). Controversies do not end there; mining has also become heavily attributed with masculinity. Although naturalised in many ways, masculinity is not the natural order of mining; this way of thinking does not appreciate the complexities of gender within the spectrum of mining. It eliminates or hides women and devalues their agency in an important economic activity. Could there be a gender politics behind the deliberate, discursive, cultural and ideological constructions of mining as an essentially male domain, a politics that also establishes only a certain kind of modern, industrial and corporatised mining as the legitimate form?

This article arises out of my various encounters with the extractive industries for over a decade. I note that feminist critiques can deconstruct such essential masculinity by appreciating the enormous evidence of women's agency – in their productive roles in mines and at home, and in their resistance to exploitations of mining. What I add to the feminist epistemology is a new way of looking at the mineral extractive practices, presenting mining as an informal, and highly feminine, economic endeavour.

The objective of this article is not to state that the ruthless application of technology, as embodied in capital-intensive mining particularly since European industrialisation, has been the motor of crisis for women. A shift away from the uncritical 'impacts of mining on

*Email: kuntala.lahiri-dutt@anu.edu.au

women' approach is one of the problematic issues that I illustrate. Like all gigantic projects that are unpopular with feminists, large-scale mining projects could too easily be turned into the 'straw man' for demolition. However, I present mineral extractive practices as in need of feminist understanding as work and as a livelihood to demystify the symbolism of the 'miner' as a masculine icon of the working class and mining as the juggernaut with gendered impacts. These are core areas of geographical research, and I believe that focusing on them would further a key area of economic geography by charting a path for future feminist geographical scholarship.

The article is based on extensive empirical research on formal and informal mines in a number of countries as well as reading (and archival searches) about mining.¹ I move between time and space and across disciplines, an important task in feminist research.² The feminist epistemology of mining I offer here can fundamentally challenge the androcentric biases in knowledge construction, and develop a perspective that establishes women as legitimate social, economic and political actors in this important economic space.

Why is there a need to engender mining?

Godoy, in 1985, wrote that anthropologists have 'recently discovered' the miner.³ Geographers, on the other hand, have a long history of analyzing mineral resource endowments, and the extractive industries and urban settlements they give rise to. Conventional geographers considered mining towns as 'distinctly deviant' in orthodox settlement theory that speaks about agricultural areas where these towns add 'eccentricity' and frustrate the development of a coherent body of theory. To Lewis Mumford, the rising industrial mines represented a demonic destruction of nature and drastic changes in human communities, and war and death.⁴ Braudel (1985, 322) related this kind of mining with capitalism, which Merchant (1990, 24) argued leads to the death of nature. Mining was also seen by most geographers, who saw farming as the 'normal' human occupation, as the quintessential 'other', a 'special' human endeavour (Gibson 1991).⁵ Unlike the natural rhythm of farming, mining is associated with luck, risk and chance, leading to displacement of families and ultimately destroying nature. Similarly, the 'miner' has also turned into the archetypal other; he is either the exploited proletariat or hero whose blackened face is admired by the urban middle classes from their comfortable vantage point. If mining is the 'other' of pre-capitalist, farm-based communities and human endeavour, the miner represents the opposite of the average economic citizen through images that visualise how Mother Nature's womb is violated and raided by hard men in search of personal or corporate profit.

What new feminist geographical perspective can be added to bestow critical depth to such binary formations? Men are naturalised in these binary constructions which imply that women are the 'other' and equivalent to nature. But, a feminist critique of technocentric, hyper-masculine mining cannot be based on women as victims, bearers of burdens of dislocations or daughters who might have dubious links with Mother Earth.

My hope is to encourage feminist geographers to gaze critically not only at the miner, but also at mining through a 'gender lens'. Mining evokes images of large machines such as bulldozers, shovels and earth movers, longwalls and caterpillars, and mechanised processes such as drilling and blasting, cutting and excavating, shafts and pits, as integral parts of mineral exploration, extraction and processing. The use of tools and machinery in capitalist mining is strongly associated with masculine characteristics, and inscribes gendered meanings on to the bodies of individuals performing the tasks. Industrial mining

operations began in Europe from where they spread to the colonies which experienced the introduction of a new kind of mining which uses such sophisticated technology.⁶ The older, traditional and artisanal mining practices were either wiped out or became illegitimate through the imposition of new systems of mineral governance. Gradually, a common vision of what mining is became established and entrenched, and feminists critiqued this particular form of mining. As I will show, mining in most of the contemporary world, particularly in those economies with large informal sectors, is much more complicated and certainly more feminised than thought before.

Another reason for developing a more informed feminist epistemology is to add further depth to policy-connected research which has recently taken on board the complex issues related to women and mining. For example, the guidance note from the International Finance Corporation requires that mining companies 'be inclusive of both women and men and of various age groups in a culturally appropriate manner' (IFC 2006, 29). The World Bank (2006) prepared a 'Guideline' that shows how to 'reduce risks of negative impacts' of mining on women and more recently the 'Gender dimensions of extractive industries' (Eftimie, Heller and Strongman 2009). The Minerals Council of Australia and the Australian Government's Office for Women (2007) have been encouraging mining companies to hire women to resolve their current skills shortage. This literature aims to develop a 'business case' that hinges upon the instrumental value of women as cheap and available labour to enhance the efficiency of private sector and economic growth. This value is also implicit in Gibson and Kemp's (2008, 105) review piece that creates a sub-category of 'indigenous women' who must be employed in the mines because they experience a 'double blind', bear the negative impacts and suffer from the lack of benefits of mining. Such 'add women and stir' (to existing analyses) is precisely what feminists have consistently maintained against. It appears that the policy literature on women and mining has fallen into the pit of a theory vacuum. I would therefore like to bring feminist politics back into the debate on mining. My hope is that this article will provide a starting point to build a framework for explaining why women and men must have equal rights to mine.

Gendering the 'devil's domain': mining as a feminine space

Feminist labour historians Mercier and Gier (2007, 995) ask:

Mining's tumultuous history evokes images of rootless, brawny and often militant men, whether laboring in sixteenth-century Peru or twenty-first-century South Africa, but women are often ignored or reduced to shadowy figures in the background supporting male miner family members. Where were women in the mining world?

The expanding literature that makes women visible offers an answer. Revisionist efforts by feminist historians to 'uncover' women's roles in mines, whether it be the American West (see Fischer 1990; Hudson 2005; Zanjani 2002; also Gier and Mercier 2006), Central Appalachia (Tallichet 2006) or Bolivia (Ortiz 1978), present them as productive agents in mining industry.

Indeed, evidence of women's involvement in mining work from very early times is aplenty, be it Agricola's (1556) portrayal of women as breaking and sorting ores, hauling and transporting them, smelting, processing and undertaking the physically-demanding job of working the windlasses in mediaeval mines or Vanja's (1993, 102) exposition on pre-industrial Europe. During industrial mining women's involvement rapidly expanded in Europe. John (1980, 20–22) shows that women in British collieries were employed as manual workers in very poor conditions. It is impossible to prove the full extent of

women's participation from employment records of these times because the male workers carefully left them out of these records after having utilised the labour of their female relatives wherever possible. Where official records exist, such as in Belgian mines during 1830–1914, it can be seen that 'until the final quarter of the nineteenth century, numbers of women working underground in Belgian coal mines actually grew' (Hilden 1993, 89). Belgian women coal miners came to be known as *hiercheuse*, the feminine version of *mineurs*.⁷ Records also show that women prospected in the American West for gold⁸ (Zanzani [1997] 2002, 7).

Economic historian Burke (1993) posits that mining work is one of the areas where women's 'agency' can be located. It is, however, important to place women's work in modern industrial mining within broader understandings of gender socialisation in mining, lest women are treated purely as 'labour commodities' in the multinational mining capital world. This commodification throws up challenges for women entering the formal mining workforce. For example, in a survey of women personnel in a modern colliery in Indonesia, I found many women truck operators in modern open cut mines quit their jobs after a few years of service. This is because following their work in the mines, gender roles for women (and men) do not change in the short term. More importantly, the mining companies that hire women for shift work fail to provide a supportive environment for them, including the lack of provision of crèches (Lahiri-Dutt 2006a).

Bulldozing women's labour in mines

Technology plays an important role in extractive industries as the use of modern labour-saving devices is the key to increasing productivity, enhancing safety and improving working conditions. Men have become associated with gigantic machines that the mining industry is known for.⁹ Technology-dependence in extractive industries is relevant to a feminist critique because a sexual division of labour is embedded in the way men and women work in factories (Williams 1992). This is the case in almost all cultures, beginning from Indus valley civilisation where 'men delved and women spun' (Sengupta 1960, 1). In mining, men dug the mineral ores and women carried and processed them. Women and men participate in different spaces, and usually operate different 'physical technologies' that require skills or knowledge that have come to be defined as male or female (such as in the jute industry in India; see Sen 2008, 107). Sexual division of labour is justified as the 'natural' complementarity of roles of women and men, but is usually accompanied by a vertical sexual division of labour or a stratified division that concentrates women into the bottom strata, with discriminatory wages and poor working conditions.

Historical and contemporary evidence reveal that technological change works against the interests of women in mining. Capitalisation of the production process is never gender-neutral; for example, women (as well as children) were an integral part of industrialised mining in Bolivia, but 'their work was lost when machines were installed in the flotation processes for sorting minerals in the sixties' (Nash 1979, 13–14). Similarly in Japan the introduction of machines destroyed the *naya* (or 'stable') system of work which had made a place – albeit at the bottom – for women in mining production in pre-capitalist coal mines (Nakamura 1994, 15–16).¹⁰ In early collieries in India, women and men – usually from indigenous communities – worked together as part of a family labour unit.¹¹ The shallow *pukuriya khads* (old-style open cuts) changed around the late 1920s in favour of shaft mining, and women's numbers began to fall (Ray Chaudhuri 1996).

Interestingly, in the past, capital justified the marginalisation of women in conjunction with other, highly gendered, global policy instruments which hid moralistic notions about women's labour. Early twentieth century debates on what is decent and safe work for women gave rise to protective legislation. In many countries that ratified the International Labour Organization (ILO) Conventions, such ideas about 'true womanhood' have cemented the doctrine of separate spheres and continue to circumscribe women's work in mines¹² (for the example of Indonesia, see Lahiri-Dutt and Robinson 2008). Such discourses also infiltrate the psyche of working class women and constrict their life choices (Lahiri-Dutt 2006b). From a high of 44% in 1900, the proportion of women in Indian coal mines fell to less than 6% in 2000, in the process turning the 'gin girls'¹³ into scavengers (Lahiri-Dutt 1999).

The miner: the man with the hard hat

Another dimension of masculinity associated with mining is the difficult working conditions that existed in early modern mines. Miners working in the pits during the early industrial era undertook dangerous, dirty and risky work, and created a universal and 'unashamedly sexist' image of 'the miner' (Burke 1993; Williams 1981, 50). Men and mining became conflated to give rise to a masculine work culture where hard unrefined men hew in 'mysterious dungeons of coal: dirty, strange men, in some ways frightening and for this reason repellent, yet attractive because they are masculine and sensuous' (Allen 1981, 4). This masculinity, however, is not 'essential' as conceived by earlier feminists (such as Campbell 1984, 97, or Robinson 1996, 137).¹⁴ It is important to remember that the male miner is socially constructed, and therefore, when he is consequently portrayed as the quintessential male representative of the working class (see Eveline 1998; Metcalfe 1988), there is a need to question this.

The masculinity of popular images of the miner is ingrained in the corporate machismo of the globalised industry, controlled by shareholders based in the global North.¹⁵ Explorers' adventures and heroism fuel this machismo; vivid accounts of the first sightings of a famous ore body turn discoverers into cultural heroes who wander across usually hostile landscapes until they find the mineral deposit. Such corporate-fuelled hyper-machismo is common in representations of mining entrepreneurs or overpaid executives which are found widely in popular media.

Strong occupational identities spread from mines into communities and render all women as 'miners' wives, or as 'reluctant pioneers' who are unwillingly thrown into mining frontiers (Kideckel 2004; Momsen 1990, 130; Murphy 1997; Pearson 1970). The exaggerated masculinity of mining cultures lead to the portrayal by social historians of mining women as being unproductive and isolated, unable to defy domestic oppression and being home-bound to take care of husbands and sons. Nash (1979, 12–13) puts women in Bolivian mining communities within the context of home as wives of male miners: restricted within the house; tending to the man; and bearing children. This portrayal is potentially dangerous as women can be celebrated for their 'supportive' roles in men's struggles against capitalist exploitation. For example, American labour historian Montgomery (1987) wrote how the solidarity of miners underground was reinforced powerfully by that of women above the ground who supported their struggle. Mining wives are then depicted as special; Cotterell's (1984, 110–11) work analyses the social ecology of families in new mining towns in Queensland, Australia, to show their 'fragile social networks' and need for more social support than their 'country-town counterparts'. Such representations of women have been extensively interrogated by feminist scholars, but even they tended to focus on the 'miner's wife', a category that overshadows the

feminine figure in mines as ‘pit women’ (as done by Carr 2001). From a Marxist perspective, feminist geographers McDowell and Massey (1984), showed how this gender division of labour creates a spatial division between the home and the mine.¹⁶ The miner’s wife, then, can become the only authentic figure in mining settlements and can (mis)represent the woman miner herself (Lahiri-Dutt and Macintyre 2006).¹⁷

The question, however, remains: do women in mining communities belong to the working class because of the roles that they take on in their own rights as women or because of their men? Industrial sociologist Williams (1981), in her study of work and family relationships in the working class communities in two open cut coal mines in central Queensland in Australia combined Marxist and feminist approaches to show how women organise consumption within capitalism and play the major part in reproduction of labour while men comprise manual workers to create and maintain the patriarchal hierarchy. Such structural interpretations, however, would be difficult, if not impossible, to follow in India where gender identities are formed by the triumvirate of sex, class and caste. Indian social historian Nair (1998, 101, 119), in her research on Kolar gold field, split open working class culture and showed that exigencies of work in a mine and life in a mining camp engendered ‘new social arrangements’ where ‘older hierarchies and divisions’ lost their meanings. Life in mining communities is characterised by groupings that cut across structural boundaries of class, individual or family.¹⁸ Even in a Yorkshire mining community Dennis, Henriques and Slaughter ([1956] 1969, 249) observe that ‘in particular the sharp cultural division between the sexes, and the attitudes consequent upon it, run right through the community and produce tension within the family itself’. Indeed, in their early work on Australia, Gibson and Graham (1992) argued that the conventional, structural definition of class was unsound under a context of industrial change, and invoked an alternative understanding of class as a multifaceted social process in which the individual woman participates at a single moment and over time.

A class-based analysis that does not intersect with other axes of identity pays less attention to ‘mining cultures’ that attribute domesticity to miners’ wives by socially constructing and locating women within the home in mining communities. These women can then be described as ‘the hewers of cakes and drawers of tea’, and relegated to their place at home for men to gather in union halls (or local pubs) in order to form their class solidarity (see Gibson 1993). Mining communities are ‘new’ communities, and ruled by the male-dominated state, the company and labour organisations. Transnational mining capital and the state ignore the complexities of gender within the community in monitoring men and women’s roles and behaviours, thus engineering a shift to the male head-of-household model (see Klubock’s 1998 study of Chile).

A critique of the overrepresentation of mining wives has been presented by Rhodes (2006), based on her personal experience of living as a mining engineer’s wife in ‘company towns’. She shows how unpaid labour by wives – at home and in the community – helps sustain a flourishing social life around mines, but ignores her own (privileged) class position. Robinson observes that the managers’ wives in the mining town of Soroako are expected to take on a leadership and welfare role in the community through involvement in the Association of Inco Families, an organisation in which their position parallels that of their husbands. Colliery towns in India have similar structures. The reproduction of company hierarchies within and between social spheres provides an informal instrument of subjugation. The relatively higher social and economic status of managers’ wives not only creates a disjuncture among ‘staff wives’ but also makes local or indigenous women ‘envious of their lifestyle’, leading to their heightened awareness of class and wealth (Robinson 2002).

Taking on the devil

Yet another area where women's agency could be unearthed is as active political agents¹⁹ who resist capitalist exploitation. Again, socialist politics in which miners occupy a central role tend to represent women as miners' wives, in passive or supportive roles. Indeed, women's various roles as miners' wives were critical in sustaining strikes in the history of industrial mining. During these strikes gender roles became blurred (see Aulette and Mills 1988 for the 'new' roles that emerged for copper community women in Arizona). Sheila Rowbotham, through an interview with Jean McCrindle, the leader of Women Against Pit Closures (WAPC), showed that such support also expressed women's 'autonomous needs' (Rowbotham 1986, 109). Feminists have recovered histories of women in such organised protests: Stead (1987) reported women's activism in a Scottish pit closure; Kingsolver (1989) showed how miners' wives and daughters joined hands with women miners to carry their flag into what was seen as a male workers' battle, the 'great Arizona mine strike of 1983'. Later analysis of Lancashire WAPC by Beckwith (1996) showed how during resistance women became effective agents in influencing political outcomes. Even without the support of trade unions, which continue to remain male-dominated, women kamins in Indian collieries have resisted exploitation (see Barnes 2006). Parpart (1986, 141–2) shows that higher wages of husbands alone did not guarantee a women's financial position. While women supported workers' struggles against capital and even confronted management directly over issues like food and housing, they also adopted an impressive number of strategies to ensure their own position. These strategies sometimes pitted gender against gender and even occasionally transcended class lines.

In summary, one sees that the masculinities of industrial mining practices are constructed in three main ways: through the symbolism of size and capital/technology; structure of the industry; and produced and reproduced identities. Gendered dualisms are used to organise social and production activities, divided between different groups of people to build a gender structure within the mining industry. These are, however, perceived dualisms – differences that have little to do with sex – and clearly past feminist critiques have contributed to illuminate the important productive roles that women play within the mining industry, in their homes and in communities.

Critique of negative impacts on women

A growing literature shows that large-scale, capitalised mining introduces a rapidity of social change that affects women more negatively than men (Carino 2002; Griffiths 2003). The gendered impacts often cut across class and race, but poorer women (and men) are more negatively affected because of their disadvantaged position. One set of literature within this genre arise from the Melanesian context where the sudden flow of large amounts of cash as land compensation into the hands of indigenous men upset the established gender relations; men also take up jobs in the mines, pushing women further into the background (Byford 2002; Macintyre 2002, 2003). More than just cash, the new, monetised economy that the introduction of a new mine ushers in changes gender relations; in India Rothermund (1994) showed that women are hired either in lower status jobs or are rendered less active economically by the changing production systems, relations and spatial orientations. Seen from such a perspective, it might be easier to understand why gender-selective impacts occur in both better-off and poorer countries. In Canada, Hipwell et al. (2002, 11) suggest these impacts on indigenous women fall into three broad categories: health and well-being; women's work and traditional roles; and gender inequalities in the economic benefits from mining activities.²⁰ A different, political

ecology-based genre of literature by feminists suggest that women are affected more because of their lack of access to assets and resources. In eastern India gender impacts are related to depleting subsistence bases and degrading the environment; women, primarily burdened with a family's food security, are rendered unproductive (Ahmad and Lahiri-Dutt 2006). Writing from an activist angle, Bose (2004, 409) positions gender-selective impacts within the environmental justice paradigm. The alienation of farming and forest land, pollution caused by a company's extraction and processing activities, and the decreased ability of women to work on remaining land due to male absenteeism are the main concerns (Bhanumathi 2002, 2003; Parthasarathy 2004). In a mining town in Indonesia, Robinson (1986, 12) notes that as wage labour for the mine becomes the principal stable form of livelihood, a large proportion of villagers start earning a living through a variety of activities in the informal sector. In the process of such change women lose their economic independence and become dependent on men, who are ascribed with new notions of authority by the mining company (Lahiri-Dutt and Mahy 2007).

A feminist reconsideration of mining would carefully handle the literature relating to the 'impacts of mining on women'. Some of this literature has helped give rise to the stereotype of women as victims, for example, 'the prostitute' who introduces or spreads HIV/AIDS or the 'contract wife' who provides concrete evidence of the fallen status of women²¹ (see Kunanayagam n.d.). I would like to qualify this; this sole focus on women as sex workers draws attention away from politics of gender relations in social changes following the introduction of capital-intensive mining. The simple fact is that men gain the cash and the authority to control the cash to pay for services they probably could not access before, and women continue to struggle for incomes in worsened situations. Sex work to survive change is neither new nor shameful; historical research has shown that contrary to popular belief, women have always followed single men to mining frontiers (Moynihan, Armitage and Dichamp 1990; Higgins 1999). Anthropological literature suggests that attitudes towards sex and money change with the introduction of mining, including in aboriginal communities (see Nash's 1981 work on Bougainville in Papua New Guinea). More recently, Emberson-Bain (1994) has reaffirmed that mining communities experience growing incidences of violence. Yet activists lament the transformation of women into sex workers as one of the gendered consequences of mining expansion (see International Women and Mining Network 2004). Civil society groups interpret the evidence of flourishing sex work in and around mine sites as women's degradation and equate such degeneration with the vandalism of nature by mining.²² Thus, the 'degradation of women' becomes equated with the degradation of the environment.

A feminist epistemology of mining would query the representation of women as 'victims of mining'.²³ The literature that equates patriarchy and capitalist accumulation in mining is reminiscent of biological determinism and essentialism, moralistic, and devoid of specificities of social and material contexts or historical understandings of women and work.²⁴ Such interpretative frameworks risk depoliticising environmental, community and gender relations in and around the extractive industries. More specifically, they can lead to a dualism between women and men, separate their spheres and spaces of production, and equate women primarily with biological reproduction.²⁵ Scholars, notably Agarwal (1994) and Sachs (1996, 16), have argued that women's poor ownership of land in rural households and consequent male ownership of productive resources shapes the gender relations, and recent feminist literature has also critiqued the representation of all poor women as victims and has questioned the conceptual duality within these representations of women as either 'decent' wives, or as 'fallen' sex workers (Higgins 1999; Mahy 2011). Therefore, attention needs to be paid to gender roles and relations in mining communities:

women's work in the home and in and around the mines, and their household subsistence duties, to understand why women might bear most of the negative social impacts of mining.

A feminist rethinking of mining

Large-scale and multinational mining has assumed more power in recent years. Its embodied power is often expressed through decentralised and highly nuanced systems of domination. For example, the effects on the families and the communities of the '7-day roster' introduced in the coal mines in Australia in the late 1980s can be seen in Gibson (1993). Other geographers have studied the 'Fly-In-Fly-Out' (FIFO) or long-distance communities that have emerged in place of the conventional, hierarchically structured and gendered communities in mining towns where notions of place, home and work have gendered meanings (see Houghton 1993). These studies dig out deeper meanings of power than just masculinist domination, and explore the links between various aspects of work, gender symbolism and identities in place. Such directions in research are fruitful in building a new feminist critique of mining by geographers.

The masculinities of industrialised mining, following Faulkner's (2009) observation of 'engineering cultures', can be said to be manifest in three, interlinked, spaces. The first space comprises the mining project itself and encompasses the practices, operations and technologies that are used in the cultural landscapes around mining. The second is the more abstract space where gendered representations of mining realities are socially produced and reproduced, reinforcing the masculinities. The third space is comprised by the global culture and controls of the international organisation of capitalised mining. However, as these spaces produce gendered identities, they also legitimise only one form of mining, and hide women's livelihoods in, and the diverse forms and practices of, the economic space of mining.

This brings me to informal, artisanal and small-scale mining practices that are collectively known as 'Artisanal and Small-scale Mining' (ASM) on which a new feminist literature is emerging from the global South. Heavily capitalised mining companies employ only a very small number of people in the world (ILO 2002).²⁶ Globally, many more people make a living out of extracting minerals using low levels of capital and technology. Although no accurate data exist, it has been estimated that for over 35 million rural people mineral extraction may provide a continuation of traditional modes of life, seasonal and supplementary cash incomes and/or a refuge from economic or environmental shocks (see CASM 2005; also Hentschel, Hruschka and Priester 2002). No geographical understanding of mining can be complete without a full understanding of these informal extractive livelihood practices. In the extractive continuum, global corporations occupy one end of the spectrum, whereas the traditional artisanal mining operations occupy the other, with a complex array of informal, mineral-based livelihoods lying in between the two. These practices have diverse historical roots and compelling contemporary or contextual reasons that are yet to be fully explored. For example, factors such as rural poverty, high commodity prices and peasants' continual search for cash incomes contribute to informal mining. In some countries, poor law and order or statist mineral governance, neglect by large companies of environmental care, and/or physical or occupational displacement of peasants living near large mining operations have forced the local people into informal mining.

Throughout the poorer countries of Asia, Africa and Latin America, informal mining contributes to the livelihoods of a large number of women and men, and produces a large

segment of global mineral output (Lahiri-Dutt 2004). Elsewhere, I have outlined why such mining has been associated with visions of chaos and plunder invoking fear and insecurity amongst economists and policy-makers (Lahiri-Dutt 2006c). Experts with a more nuanced understanding of the gamut of issues facing society, such as environmental sustainability, poverty, gender, livelihoods, market access, labour and occupational health and safety, have opposed this view (see Hilson 2009; Hilson and Potter 2005; Jønsson and Bryceson 2009). The concentration of women's labour in this kind of mining reasserts current global trends in respect to women's work and indicates that all mining is neither essentially corporatised nor always exploitative, nor alienated from wider socio-political and economic forces changing rural economies in poorer countries.²⁷ The numbers of women in ASM is high and on the rise (Caballero 2006; Werthman 2009). Although gold and diamonds are in the international spotlight, often due to market-end policy initiatives such as the Kimberly Process²⁸ or fair-trade certification, many people, particularly women, are involved in digging lower-value industrial minerals (Lahiri-Dutt 2008).

A new feminist agenda would be to explore how for some women mineral extraction continues traditional modes of life, but for most it provides seasonal cash incomes in addition to primary incomes from farming-related jobs. In areas of recent large-scale mining expansion, decay of farming and loss of livelihoods may force the jobless to seek incomes from informal mining. The range of practices within this sector produces a need to understand the gender roles and relations within peasant mining communities. How do they change when mining provides 'a way out' of subsistence agriculture (or forestry), that is, when rural communities undergo 'depeasantisation'? What links exist between de-agrarianisation and women's labour in such informal mineral-based economies? As liberalisation and structural adjustment programmes set a model of development, they also fuel the uncontrolled growth of poverty-driven gold mining by marginalised and impoverished peasants (Hilson 2001, 2002). During the explosion of ASM in the post-reform Ghana economy, women have taken up ASM in large numbers to provide family subsistence (Hilson and Potter 2005). Consequently, women are overrepresented in informal mining; while women comprise around 15% of the legal small-scale metal mining labour force they form over 50% of the illegal, galampsey, miners (Banchirigah 2006).²⁹

Although peasant mining has a long history, it is poorly accommodated within the gamut of mineral laws in almost all the countries. In Indonesia, for example, small-scale mining and quarrying for industrial minerals by family groups has been recognised through the People's Mining (Pertambangan Rakyat) Act, but mining for precious metals is still illegal (Lahiri-Dutt 2004). Strong environmental lobbies that tend to oppose all mining further add to the invisibility of women. Yakovleva (2007) highlights the lack of alternative economic opportunities and focuses on risks faced by women in low-skilled jobs. Moretti's (2006, 5) work in Mount Kaindi in Papua New Guinea shows women's participation in ASM as the outcome of men's nearly complete domination of the contemporary space of production and social reproduction. The extractive landscape builds up in accordance with 'traditional' principles of land ownership; consequently, almost all registered mining leases, tributary rights and customary land are held by men and transmitted patrilineally. Even in matrilineal societies such as the Maroons of Suriname, Heemskerk (2003, 7) noted that artisanal mining women had poorer access to political power, money, capital assets and contacts with the outside world than men. Amutabi and Lutta-Mukhebi (2001, 5) explain this disempowerment of ASM women in terms of lack of land rights: 'women have only access to but do not control land ... The traditional social system deprives women control of mining pits and only allows them access through men. Thus, their overall status in the production process is low.' A similar

pattern is seen in Latin American quarrying communities. Women occupy a number of roles as labourers undertaking the most labour-intensive and informal jobs in Bolivia as *palliris* (van Hoecke 2006), which are associated with their subsistence roles. Hinton, Veiga and Beinhoff (2003, 13) note that key factors in determining gender roles and status of women in ASM include ‘women’s and men’s access to and control of, resources; their ability to attain knowledge of resources, their decision-making capacity or political power; and beliefs or attitudes that support or impede the transformation of gender roles’. Graulau (2006, 299) put women’s labour as the core of capital accumulation in mining frontiers of the Brazilian Amazon:

Vulnerability of women’s labour in *garimpagen* is inscribed in broader processes of capital accumulation in the Amazon region ... Women’s labour has been crucial in the expansion of capitalism and the reproduction of its modes of production in the mining frontier.

Whether or not this is true needs further exploration. For now, suffice to say that a feminist critique of mining can provide serious challenges to what Godoy (1985, 210) called the ‘fetters of so-called capitalist epistemology’ that obscure gender within the structured class analysis.

To recognise women’s agency in mining, one needs to step beyond not only the current discourses of victimhood and see women as key actors – within industry, artisanal mining, leading protests and as active economic agents at home who sustain and nourish mining communities – but also ask what mining actually means to the poorer communities. Mining mineral-rich tracts in these countries provides part of the ‘livelihood basket’ for millions of poor. Informal mining is yet to be deeply understood and theorised; it is still unclear how the poorest women find a way to survive when economic reforms or structural adjustment programmes, and environmental shocks or rising commodity prices displace all other livelihood means. A new feminist epistemology of mining would focus on women and men’s lives in informal extractive practices where they neither own the land and the minerals, nor are they ‘exploited’ in the conventional sense as a ‘working class’. As mining breaks new ground in poorer countries, feminist geographers are well placed to explore and develop this area of inquiry. Feminist geographers can open up new epistemologies that destabilise the masculinism around mining, critique the spatial politics that sustain the gendered spheres and the institutions, and illuminate the cultures and practices that uphold gender inequalities and other forms of domination in informal mines and quarries.

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Notes

1. My research was primarily done in the countries of South Asia, but also in Indonesia, and more recently in Laos PDR, Papua New Guinea and Mongolia.
2. Analogies between mining and feminist social research have been drawn, as both ‘intervene in and disturb a landscape by probing and digging for a rich lode of ore or layer of stratum that has hitherto lain covered, or unknown, perhaps until now unvalued. Women’s knowledges and contributions, like untapped mineral wealth, had lain unused simply because the society had no use for them’ (Gibson-Graham 1994, 206–7).
3. Since then a rich literature has developed in the discipline (see Ballard and Banks 2003).

4. To him, mining and war were closely related twins: the 'curse of war and the curse of mining are almost interchangeable: united in death' (Mumford 1967, 240). He considered early mining not as 'a humane art' but 'a form of punishment' (1934, 67), referring to the horrific working conditions in early industrial mines.
5. Geographers commented extensively on migration into mining towns resulting in their ephemeral nature and pronounced ethnic and occupational segregation. Often mining community studies reflect this 'distance' or 'remoteness' from the rest of society or the mainstream (see Pattenden's 2005 description of her study community in Australia).
6. In the contemporary world, large mining projects represent global capital that is seeking new resource-rich areas such as Indonesian Borneo or Papuan province. In these poorer countries, foreign multinational mining companies, incorporated in the far-away and richer countries like the UK, Canada, Australia or the USA, represent the free-flow of capital in a globalised world. The governments of these countries welcome the capital investment as a source of revenue.
7. The *hiercheuses* worked in shifts, going down the mine at 5 am, and returning at about 9 pm, loading between 60-70 chariots (Hilden 1993, 110-11).
8. Zanzani (2002, 7) writes: '[T]he woman prospector at work on her claim (in late 1800s and early 1900s), pounding her drill into the recalcitrant quartz with an eight-pound sledge, igniting the blasting powder, shoveling away the rock fragments, and sometimes packing out ore samples on her back.'
9. Feminists have debated both impacts of technology as well as women's contributions in it (see Herring 1999; Rowbotham 1995). Early feminist investigations on gender in natural resource management illustrated that gender is the crucial determinant of the context in which technologies are imposed (see, for example, Boserup 1970; Shiva 1989). By early 1990s, it was recognised that the impacts may be both positive and/or negative or mixed in nature, and that race, ethnicity and class play important roles in producing different impacts for different groups of women. It has been emphasised that technology is not a unitary category like 'women', and particular fields of use and specific contexts of their application can offer diverse outcomes (Wajcman 2004).
10. 'A semi-feudal *naya* system had a married couple working as a unit, the husband (*sakiyama*) digging out the ore and the wife (*atoyama*) assisting him by carrying away the coal. Nakamura (1994, 15-16) also notes (1994, 15): 'The proportion of female labour in the mine workforce had stood at 26 per cent in 1925, but decreased to 22 per cent in 1929, and to 10 per cent in 1935.'
11. The 'family wage' is one area of controversy and early socialist feminists have made important contributions in showing its exploitative nature.
12. The earliest forms of protectionist legislation were bans on night work brought forth by ILO's 1919 Night Work (Women). The one most specific to mining is C45 Underground Work (Women) Convention of 1935, which prohibits women from being employed underground in a mine, and applies to both public and private undertakings 'for the extraction of any substance from under the surface of the earth'. The global movement for protection of women workers in the second half of the nineteenth century exemplified the concern with women's specific difference while ensuring their right to be part of the paid labour force. The contrary positions were reflected in the division between women's groups that wanted the state to protect them from excessive exploitation and those that felt protective legislation was a form of discrimination against women workers. Much of the protection debate was bogged down by the equation of equality with sameness: an inability to recognise equality under conditions of difference, as is now at the core of Equal Employment Opportunity (EEO) legislation.
13. The term 'gin', an abbreviation also used in other industries such as cotton textiles, was derived from the English term, 'engine', that represented a machine very useful in the early days of modern mining. In Indian collieries, although the mining appliances and methods were generally simple until the 1940s, gins played an important role in early mechanisation. During that time, shallow shafts were sunk every few hundred feet and quarries were often opened below the high water mark whenever an outcrop was found near a waterway. From the face to the pit bottom, coal was brought in head baskets by women, and then put in larger baskets. These coal baskets were then wound to the surface by the winding engine, or the 'gin' which was operated by groups of around 20 women. Archival records of this time describe indigenous women's singing and winding the gin at the same time. Small 'beam' engines were occasionally employed to do the combined work of pumping and winding and were run by three women.
14. See Lahiri-Dutt and Macintyre (2006) for more on such representations.

15. Jomo (1990) described how, during the 1986 tin crash, the young, suit-wearing men and women working in London Metal Exchange took decisions that destroyed livelihoods of thousands of tin miners in Malaysia, Indonesia and Bolivia.
16. Feminist historians disagree to this spatial division as a complete separation; Schofield (1985, 691) notes that 'the interaction between home life and work life characterized mining communities everywhere'. She observes that women and men in mining towns shared values and traditions which centred on the mine to a point where the definition of work culture can be extended beyond the workplace to encompass the community.
17. Mercier and Gier (2007, 998) recount how employers and state saw their interests tied with male miners and reinforced gendered practices, at times viewing miners' wives as assets because of their 'peculiar industrial and economic importance' to create and sustain a docile workforce, and at others seeing them as liabilities, trying to control the numbers of women in mining camps.
18. Early feminist work by labour historians is invaluable in understanding the gender dynamics of company towns such as Thurber, Texas (Rhinehart 1992) or Helena, Montana (Petrik 1987).
19. See Stead's 1987 work on women's roles in the 1984–1985 miners' strike in Britain.
20. Yukon Conservation Society (2000) describes the impacts of feast and famine cycles on women. It states the position through the voice of an elder: 'We the women, who are keepers of the hearth and home must ... take an active role in determining the future of the lands and resources we have. Our job is to see to the well-being for the next generations to come.'
21. The entry of a cash-based economy has indirect effects such as the flow of cash in men's hands, being spent on sexual promiscuity.
22. See for example Robinson's 'Bitter Harvest' (2002) reprinted in the *New Internationalist*, available online at <http://www.newint.org/issue299/women.html>.
23. One segment of this material is the derivative of the highly contested Women, Environment and Development literature, which emphasises the affinity of women with their environments (see Dankelman and Davidson 1985; Plumwood 1992).
24. To assert that all women in the less developed countries are connected to nature is undoubtedly a gross exaggeration, although this view has been wildly popular amongst many women's and activist groups, especially through Shiva's (1985, 1989) writings as an authentic 'Southern' voice. This view can turn all women as a homogeneous category whose reproductive labour is idolised and whose inherent closeness to nature is romanticised at the cost of exploring the intersection of race, ethnicity and class relations (Leach 2008, 82) and then burden women with the responsibility of nature conservation (Sontheimer 1991).
25. Experts have shown that, unlike what Ester Boserup (1970) thought, women in many poor countries are not responsible for a separate feminine subsistence sector as opposed to the commercial production sector (Whitehead 1990, 54–60). Women in the developing countries have added their voice to this debate, and criticised generalisations about women whilst appreciating that in their biological reproductive role women experience a commonality of functions and responsibilities.
26. With mechanisation, employment opportunities in the formal mining sector have been declining.
27. The proportion of women among workers in small mines and quarries can vary from 10% to 50%, with an intricate gender division of labour in which men undertake 'heavy jobs' and women carry out repetitive chores of carrying and processing (see, for example, MBDA 2004).
28. Kimberly Process Certification Scheme was introduced in 2003 by a United Nations General Assembly Resolution 55/56 to stop informally mined diamonds entering the world market so that money from their sales cannot fund rebel groups. It was meant to assuage the customers that by purchasing diamonds they are not financing wars or violent human rights abuses.
29. According to the 2001 Census of India data on work, women comprise around 14% of all full-time workers in India in the mining and quarrying sector, but the extent of informalisation of women's labour is evident from the much higher proportion – 33% – amongst those defined as 'marginal workers'. The participation of women is highest in dolomite mining (33%), mica mining (25%), clays mining (23%), stone quarrying (23%), salt extraction (23%), manganese ore mining (21%), gem stones mining (19%), and so on, indicating that women's labour is concentrated in the small-scale or informal mining sector. Even within these sectors, women's participation is higher as 'marginal workers', that is part-time and informal workers, in dolomite mining (40%), mica mining (40%), clays mining (35%), stone quarrying (38%), salt extraction (59%), manganese ore mining (40%), gem stones mining (34%). In gold ore mining, women

comprise 57% of marginal workers, with chromium ore mining also employing women as 38% of the marginal workers.

Notes on contributor

Kuntala Lahiri-Dutt is currently a Fellow in the Resource Management in Asia Pacific Program in the College of Asia and the Pacific, Australian National University. Kuntala was trained as a geographer at the University of Calcutta and received her doctoral degree in 1985 from the University of Burdwan where she taught until 2002. Her early research was on social and urban geography; a book on the Anglo-Indian community was published in 1990 (*In Search of a Homeland: Anglo-Indians and McCluskiegunge*. Calcutta: Minerva). Since 1993, Kuntala has researched environmental and resource management: social changes in the coal mining belt in the upper and middle parts of the Damodar Valley, and water management, flooding and drainage problems in its lower reaches. Kuntala's scholarly contributions have drawn attention to the livelihoods of the marginalised and poor, including women. She has edited, jointly with Martha McIntyre, *Women Miners in Developing Countries: Pit Women and Others* (Ashgate, 2006); jointly with Saraswati Raju, *Doing Gender, Doing Geography: Emerging Research in India* (Routledge, 2011), and *Gendering the Field: Towards Sustainable Livelihoods in Mining Communities* (ANU E Press, 2011). She is currently working, jointly with Gopa Samanta, on a book manuscript, *Dancing with the River: Land, Water and people in the River Islands of the Damodar River in India*.

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ABSTRACT TRANSLATIONS

Mujeres excavadoras: hacia una nueva agenda para las críticas feministas de la minería

Este artículo aborda el tema de cómo una perspectiva feminista contemporánea puede problematizar la antigua tarea humana de la minería, e indica qué dirección útil puede tomar la investigación sobre la interfase entre las industrias extractivas y el género. La investigación feminista ha confrontado discursos masculinistas de la minería por medio del cuestionamiento de la naturalización de los hombres como trabajadores industriales, y a través de la ilustración de los impactos género-selectivos de los proyectos de minería capitalista. Exploro en las fuentes de estos discursos masculinistas de minería y reinterpreto estas críticas. Más importante, resaltando el amplio rango de prácticas extractivas que reflejan las diferentes etapas de acumulación de excedente, exhorto repensar la minería en sí misma como un área de trabajo femenino. Finalmente, hago sugerencias provisionarias de cómo el campo de las mujeres y la minería podría ser examinado y abordado por las y los feministas contemporáneos. Una crítica feminista de la minería giraría en torno a la revelación de la agencia de las mujeres en la minería y una revisión de las definiciones convencionales de la minería como trabajo industrial y comenzar a ver las formas de sustento femeninas en la minería.

Palabras claves: minería informal; género; mujeres; representaciones; tecnología minera; impactos de la minería

挖掘女性：迈向女性主义矿业批判的新议程

本文探讨当代女性主义视角如何问题化早期人类的采矿活动，并指出研究采矿工业与性别交界的可行方向。女性主义研究透过质疑男性等同劳工的自然化现象，以及描绘资本主义采矿计划中性别筛选的影响，挑战了采矿业的男性气概论述。我则进一步探究采矿业中男性气概论述的根源，并重新诠释上述之批评。更重要的是，藉由强调采矿实践的多元类型，及其所反映的剩余价值积累的不同阶段，我鼓吹将采矿重新思考为女性化之工作。最后我将对当代女性主义如何探讨女性与采矿场域提出实验性的建议，此一女性主义的矿业批判是以发掘女性在矿业中的主体性为枢纽，并重新检视将采矿业视为工业工作的传统定义，开始正视采矿中的女性生活。

关键词：非正式采矿、性别、女性、代议、采矿技术、采矿之影响