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Social Debt : Ecological Debt : Embodied Debt

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From the World Social Forum to G20, the call is 'cancel the debt'. For it is widely understood how World Bank lending policies impoverish communities in the global South by demanding interest repayments many times greater than the sum they have borrowed. The global North recognises that cancelling unpaid interest on so called development loans, removes opportunities for easy capital accumulation; and so, some metropolitan powers are looking for new ways of doing business with the clean, resource rich, non-industrial periphery.¹ But peasants, indigenes, and autonomous grassroots women, are watching them. These diverse groupings became a loose political alliance at the 1992 Rio Earth Summit, when a new dimension entered international conversations about foreign debt. Corporate leaders and politicians were becoming aware of nature's cycles of purification and renewal through sunshine, soil bacteria, streams, and plant life. To the commercial eye, these free 'environmental services' were potentially valuable; not only in sustaining the very possibility of production and consumption, but as tradeable commodities in themselves. So at Earth Summit, the global North offered the South a new 'win/win' solution to their foreign debt crisis - 'debt for nature swaps'. The rationale was: developing countries might be low on cash, but have ample biodiversity for DNA harvesting, and forests for converting carbon waste from industrial regions into breathable oxygen again. At the time, it seemed an appealing idea for big states in the North and small states in the South to negotiate these debt for nature trade offs. The idea soon entered the jargon of international relations and appeared in the UN Framework Convention on Climate Change as a Clean Development Mechanism (CDM).

However, activists in the global South, particularly women environmentalists in Ecuador, saw things differently. They turned the North's functionalist analysis of the earth as 'a physical system in equilibrium' into an historical diagnosis of the earth as a social system in dis-equilibrium. For the truth is, that a 500 year long colonisation of South American land and appropriation of natural goods like silver, timber, or potato seed by the merchants of Europe, has left the global North far more heavily in debt to the South, than vice versa.² If a notional monetary value is imputed for extracted resources and ecosystem damage, the affluent world's ecological debt to the global South far exceeds the latter's unpaid World Bank loans. Corporate patenting of traditional knowledge from the global South - as intellectual property of the North, is another facet of ecological debt. In fact, the injustices of modernisation are multiple, as confirmed by scientists and ecological economists in a publication of the US National Academy of Sciences:

... we make a conservative estimate of the environmental costs of human activities over 1961-2000 in six major categories (climate change, stratospheric ozone depletion, agricultural intensification and expansion, deforestation, over fishing, and mangrove conversion), qualitatively connecting costs borne by poor, middle income, and rich nations to specific activities by each of these groups. Adjusting impact valuation for different standards of living across the groups as commonly practiced, we find striking imbalances ... Indeed, through disproportionate emissions of greenhouse gases alone, the rich group may have imposed climate changes on the poor group greater than the latter's foreign debt.³

The post-Rio debt for nature logic only adds to what the global North owes to former colonial regions. Of course, the actual calculation of ecological debt in monetary terms would be an impossible computational exercise, but efforts such as the one above are good for ecological consciousness-raising. The next step is to look into how the typical capitalist process of monetary valuation of nature as such, reinforces an epistemologically reductive reading of complex relational processes, by attempting to measure weblike metabolic relations of matter and energy along a single linear index. This said, the campaign for public recognition of ecological debt goes forward, and it is critical that people committed to global justice support it. At the same time, publics and decision makers must turn to the deeper questions, like: What is the character of these peculiar social relations of production that cause all kinds of debt?⁴ Are there other ways by which humans can satisfy their material and cultural needs without debt?

Triangulating political ecology

Such questions speak to two contexts. The first is people's struggles for an alternative to globalisation, particularly women, worker, peasant, indigenous, and ecological activists in the *alter-mondiale* movement. The second is the crisis of relevance affecting contemporary academic disciplines like political ecology, ecological economics, environmental ethics, and even women's studies. Beyond capitalism, the footprint of corporate expansion that compromises life on every continent is 'rationalised' by patriarchal 'mores' - militarism, the world's greatest polluter, not least of them.⁵ Violence and calculated competition pervade the global economy, a system in which living habitat is sacrificed for a few; and so called 'minorities' of gender, race, and class, are unfairly used. However, sex/gender is the hardest of these discriminations to resolve, because it has the longest history.⁶ Women's subjection is supported by an old belief that they are 'closer to nature' than men. In colonial times, cultural allusions such as these gendered and racialised metaphors would be used interchangeably by ruling elites: just as women were unclean, so were natives; and the 'exotic oriental' man was invariably said to be 'feminine'. These deeply rooted attitudes have served to construct the inferiority of 'others' and to justify the exploitation of their bodies alongside the resourcing of nature at large.

Questions of exploitation and relations between one economic class and another are the classic terrain of political economy. But today, this discipline is being re-framed as 'political ecology' in order to include the ecosystem that

humans are embedded in. At the same time, in an era of feminist and postcolonial liberation, gender and race become integral to any such analysis. Conventional political economists explain where profit comes from, by identifying a 'theft' of labour time from the bodies of workers. As they point out in the labour theory of value, in manufacturing a commodity, the worker generates a 'surplus' for the entrepreneur but never receives back in wages as much value as he or she puts in. However, as political economy is transformed into political ecology, additional concepts are needed. This essay begins with the readily understood activist notion of 'ecological debt' to describe how the very means of production itself in non-industrial communities is still being stripped away by colonisation. Ecological debt involves another theft, an appropriation by capitalist developers of people's livelihood resources. But importantly, both kinds of theft extract life giving 'metabolic value' from nature - and there is even a third dimension to take account of. For the means of production is held together by reproductive workers, who maintain its 'conditions of existence'. One of the most important of these conditions is the intergenerational supply of new labour power. Political ecologists, ecological economists, ethicists, and others, might look towards a model that integrates these three kinds of subsumption:

- the *social debt* owed by capitalist employers for surplus value extracted from the labouring bodies and minds of industrial, service, and enslaved workers (the focus of *socialism*).
- the *ecological debt* owed by the global North to the South for direct extraction of the natural means of production or livelihood of non-industrial peoples (the focus of *postcolonial and of ecological politics*).
- the *embodied debt* owed North and South to unpaid reproductive workers who provide use values and regenerate the conditions of production, including the future labour force of capitalism (the focus of *feminism*).

The 'movement of movements', which includes workers, women, indigenes, peasants, and environmentalists, may also find it useful to think about their respective *alter-mondiale* struggles as interlocking forms of debt, labour, and value, in a world wide system of capital accumulation. Significantly, all four movements converge in the irreducible metabolic space where humanity and nature materially flow into each other.

If political ecology moves beyond the anthropocentric focus of political economy, an 'engendered' political ecology will open up the meanings of exploitation and accumulation even further, by exposing internal relations normally kept inside the patriarchal black box. That knowledge making applies an 'embodied materialist' epistemology.⁷ It engages with discourses from socialism, women's studies, and postcolonial theory, but simultaneously defies their limited ecological understanding. Equally, an embodied materialist perspective challenges professionals in environmental ethics or ecological economics for a limited grasp of global justice questions. To help articulate this all but taboo margin between the human and the natural, some new working constructs are introduced: - embodied debt - meta-industrial labour, eco-sufficiency, metabolic value and fit. The harmonious material process by which humans take from nature, digest, and give back in return is known as the

humanity-nature metabolism. Capitalist industrialisation and the rise of cities created a 'metabolic rift' in this thermodynamic reciprocity, environmental degradation the result.⁸ However, beyond the circuits of capitalist exchange, in the home and in the field, this metabolism remains intact and the value that it creates is preserved by people doing 'meta-industrial labour'. The non monetary but regenerative activities of this hitherto nameless class are entirely necessary for the global economy to function. Meta-industrials include householders, peasants, indigenes and the unique rationality of their labour is a capacity for provisioning 'eco-sufficiently' - without leaving behind ecological or embodied debt. Where 'development' has not consumed local resources, the labour of peasants or indigenous gatherers in the South demonstrates a good metabolic fit between human needs and biological growth. It preserves and generates metabolic value. In the North, the meta-industrial labour of mothers and other human care givers is also attuned to natural cycles. These reproductive labour forms give rise to a distinct set of economic skills and values - at once material and ethical.⁹

In an era of post-Kuhnian scholarship, where feminist and postcolonial understandings are widely acknowledged, an embodied materialist understanding is indispensable to the transdiscipline of political ecology.¹⁰ US philosopher and activist Chaone Mallory describes the approach as 'prefigurative', and identifies it in the vital citizenship politics of ecological feminism, which

... originated in direct action movements, such as the peace movement, anti-toxics movement, and mother's movements, and then moved into the academy explicitly to use its tools and epistemological resources to better effect change in intra-and trans-human ecosocial relations. Ecofeminism has been called 'engaged theory' and asserts that theory and praxis are mutually reinforcing. Theory is made more relevant, accurate, and compelling when it incorporates the perspectives, knowledges, and voices of those who are struggling for change 'on the ground' ...¹¹

To be sure, an ecological feminist perspective emerges from *praxis* - action learning - and has nothing to do with some special 'virtue' of 'the fairer sex and weaker vessel'. The global majority of women - being mothers and care givers - are culturally positioned as labour right at the point where humanity and nature interact. Likewise, men 'outside of' capital, such as small farmers and forest dwellers, undertake regenerative or meta-industrial labour. Unlike factory work, or academic work, the labour of these socially diverse groupings oversees biological flows and sustains matter/energy exchanges in nature.¹² It is certainly no exaggeration to say that the entire machinery of global capital rests on the material transactions of this reproductive labour force. Embodied debt is accrued by the global North when it denies forms of value generated by this gendered and racialised labour. But over and above any notional calculations, these agents of complexity are practising both an alternative economics and an alternative epistemology.

In related vein, Philippines sociologist Walden Bello writes of the environmental movement in the global South as 'The Pivotal Agent in the Fight Against Global Warming'. Australian academic and AidWatch activist James Goodman considers that the South now has 'political leverage' on the international stage, as does South African political economist Patrick Bond.¹³ Each scholar argues from a social justice perspective, pointing to how the ecological footprint of the South is far less than that of the North. But the case for leadership by the South is stronger than any moral position based on a 'we are not the polluters' argument. Many of these communities have invented models of economics that protect ecological sustainability. A 2007 posting by the international peasant movement *Via Campesina* implies this when it claims: 'Small Scale Sustainable Farmers are Cooling Down the Earth'.¹⁴ What is at stake here is an intellectual knowledge base honed in meta-industrial labour; an 'epistemology of the South', to borrow Boaventura de Sousa Santos' phrase.¹⁵

The counter-entropic logic of regeneration contrasts sharply with the corporate push for a Knowledge-Based-Bio-Economy (KBBE) being sponsored by the European Commission.¹⁶ Here the additive processes of molecular biology are to become the driver of 'productivity and competitiveness'; but a bio-economy in the true sense of the word is only found at the periphery, where meta-industrial provisioning is eco-sufficient. The bearers of ecological and embodied debt are thus not simply victims of capitalist patriarchal institutions, they are leaders, and their people's science is one for the global North to emulate. The bearers of debt are also innovative political strategists in the struggle for global justice. For example, in August 2007, grassroots movements in Quito established a Commission for the Integral Audit of Public Credit (CAIC), to examine the legitimacy of foreign debt claimed by predatory financial institutions in the North. The *Quito Statement* announces the formation of a Social-Ecological Debt Creditors Alliance among nations of the South who have been exploited by global financial institutions, and it supports withdrawal from the International Center for the Settlement of Investment Disputes (ICSID). The *Quito Statement* also demands the removal of para-military squads sent by the global North into 'developing countries' to protect corporate activities. It demands full citizenship rights for displaced military-economic refugees to the North; and reparations from governments of the North as conditional to any future trade agreements. Peasant and indigenous communities in Ecuador are taking legal action against Chevron-Texaco, and their government has resolved to respond to global warming by keeping its crude oil in the ground to protect the integrity of Yasuni National Park.¹⁷

Models of eco-sufficiency imply local autonomy and resource sovereignty - and by these means, global justice. But because the capitalist system is at the same time a patriarchal system, the delivery of justice must be sex/gendered. Advocates of social change will need techniques like gender literacy, ideology critique, and personal reflexivity, before old social institutions and economic relations can be deconstructed and new ones put in their place. *The Quito Statement* speaks of ecological debt but not of embodied debt. The closest it comes to the latter is 'social debt' - a catch-all phrase that essentialises labour as a single process disguising the multiple forms of

material reproductivity that are specific to women's work. But the failure of gender awareness has been equally apparent at the World Social Forum, cutting edge of the global movement of movements, whose *Manifesto of Porto Alegre 2005* was drafted by 18 white men and 1 African woman.¹⁸ Reflecting on this, Santos writes: the way forward is through acknowledgement and voluntary self-criticism, and by setting up new conventions to ensure that it does not happen again.

Many academics, activists, and policy makers, have difficulties integrating sex/gender issues in their environmental analysis. This is not at all surprising, because in the dominant global culture, the ontological condition of humans as part of nature is obscured by old gender myths. One time-honoured ideological stricture divides a 'masculine gendered' man from matter, positioning him 'over and above' raw material nature. A related stricture divides this man from 'woman', positioning her 'down in' with nature. Elsewhere, I have speculated on the source of this collective denial of women as full social agents - as the ancients had it: man is 'mind', while woman is 'body'.¹⁹ But patriarchal origins notwithstanding, women's fertility is soon enough captured as an economic resource for capitalism - much as the corporate world now realises that it can commodify life giving environmental 'goods and services' like water, air, and forests. Ewa Charkiewicz has spelled out the process, by tracing the genealogy of women's juridico-political subjection in economic texts from classical Greece and onwards to the Chicago School. Silvia Federici backs up that analysis by explaining how in the emergence of mercantilist Europe, the unvalued regenerative labours of women, and later slaves, were, and are still today, the indispensable force behind global capital accumulation. Susan Hawthorne has examined how the discourse of mastery promotes social control by reducing biological complexity, then covering its tracks, by deleting history. The synchronic statistical correlations of ecological economics are a case in point.

Sublimated or subconsciously displaced sex/gender attitudes are an integral factor in how the economy functions. In fact, gendered power relations have infused every field of human endeavour - from pig farming to positivist science, from religious imagery to economic logic. But the social construction of gender difference has been achieved by recourse to a highly abstract 'symbolic nature', one that mystifies its materiality, and our own human embodiment in that. The master discourse operates through two supposedly natural and complementary ideal-types - masculinity and femininity - deleting the fact of men's and women's shared material identity. Under the eurocentric canon, masculinity is treated as part of civilisation - on the human side of the humanity-nature dualism - while femininity is treated as 'closer to nature'. The notion of 'citizenship' replicates this mantra, so that today, women who would be emancipated face many contradictions. Women, deprived of the vote for centuries, are now expected to adopt the behavioural gendering of 'universal man' in order to prove themselves worthy of it. Similarly, indigenous people who now enjoy the privilege of sitting on deliberative committees are expected to obey ostensibly universal - but really eurocentric - terms of reference. To question such terms is to commit a gaff. On the other side of the coin, the association of femininity (and indigeneity) with the 'lower order of nature',

explains why it is considered humiliating in many quarters, to draw attention to a man's 'feminine' side.

When deeply personal and libidinally charged cultural attitudes go unexamined, they can lead philosophers, political theorists, and economists into falsely essentialised thinking. Thus some researchers overlook the fact that people who are differently sex/gendered do not have the same access to resources, do not get the same pay for the same work, and most importantly - do not get to use matter/energy with the same outcomes for the ecosystem. Economists have no trouble acknowledging differences with respect to variation in the consumption levels of regions, and they often communicate that with the ecological footprint metaphor. This brilliant - albeit ahistorical - indicator was devised by Canadian biologist Bill Rees and his colleague Mathias Wackernagel to measure 'how much nature we have, how much nature we use, and who uses what'. The ecological footprint 'represents the area of biologically productive land and water a population requires to provide the resources it consumes and to absorb its waste, using prevailing technology'.²⁰ International footprint comparisons show clearly the ecological debt that the industrialised global North owes to the South with its pristine forest stands and fishing grounds. The ecological footprint is also used by the environmental justice movement to show how the living areas of lower class or racialised communities are targeted as landfill sites by the beneficiaries of capitalist consumerism. But to this point, the ecological footprint has been applied in an essentialist way, aggregating humanity as a unity, and failing to differentiate between socially ascribed masculine and feminine consumption behaviours. On the other hand, if the measure were used in a gender literate way, it might help deconstruct injustices of 'the body economic' by demonstrating the markedly lower ecological footprint or ecological debt generated by women compared to men globally speaking.²¹ As Meike Spitzner points out in the context of global warming - this phenomenon is gendered in its causes, effects, solutions, and policies. And why it is that the United Nation's concessional principle of 'common but differentiated responsibilities' applies between small and big nations, but not to women vis a vis men.²²

Could the ecological footprint as a measure of geographic or exosomatic energy use be adapted to communicate the invisible but systemic debt born by women? Embodied debt concerns the harnessing of physiological or endosomatic energy in the context of unjust power relations. Perhaps embodied debt and meta-industrial labour is better expressed not by spatial analogies as ecological debt is, but by the vector of time? For example, research for the European Parliament records that it is mainly unwaged women who run or wait for public transport, and the trade off is that while they may save nature by this free (or enforced) choice, it adds to their own time poverty.²³ Again, the timing of reproductive labour tasks is slower than the speeded up pace of capitalist time, because regenerative work is bound to preserving, not interrupting natural processes. This responsiveness to the needs of plants or human bodies is what makes meta-industrial labour appear to be achieving very little, while in fact, it is achieving the highest goal of balancing economic provisioning with intergenerational sustainability. All this goes to show how monetary value as conceived in the masculinist economic framework is a badly skewed tool. To

echo the veteran socialist feminist Selma James: by the logic of men's 'exchange value', he who bombs a forest with dioxin is considered to generate worth and is highly paid accordingly, whereas the woman who builds her hut of hand-cut wattle and daub, then births a new life within, creates only 'use value', is not considered to be working or 'adding value' and remains unpaid.²⁴

An acknowledgement of how notions like 'exchange value' are profoundly sexualised is essential to achieve lasting change. But such a claim looms like a Galilean heresy in the face of modernist reason. The political Left and Right have each resisted what ecological feminist scholars and activists have had to say, but the humanity-nature relation is a problematic construct for some feminists too - at least for those who identify with core values of the global North.²⁵ Quite early on, the ecocentric lens was rejected by some educated women, uncomfortable at being associated with the swamp of material nature in any way. They noted too, that connecting all women with 'nature' might blur important sociological differences. As the technologised urban lifestyle now transcended earthiness, re-kindling any such association was thought to be a politically backward move. However, the global majority of women do labour hands-on with nature and cope with the matter/energy transformations of their own gestational bodies. In this respect, academic attempts to silence womanist voices sound rather like class denial on the part of serviced, time free, and often childfree, middle class feminists.²⁶

Some liberal feminists, and men who follow their cautious political line, have incorrectly judged ecological feminism to be conservative theory, because it opposes the gender neutrality of mainstreaming policy. Ecofeminists argue that 'mainstreaming' suits masculinist governments, because it saves them dealing with women's specific materially embodied needs. The problem here is that mainstreamed feminists conflate what ecofeminists say, with what ancient woman-nature mythologies say - that women have a fixed, innate, identity or essence, which is 'closer to nature' than the essence of men is. In fact, materialist ecofeminists emphasise that both men and women are made of nature, while yet socially, geographically, historically, constructing their lives. Liberal feminists thus fall into the error of making an idealist or culturalist reading of a materialist literature, failing to observe how myth and ideology operate in the service of economic power.²⁷ The objection that ecofeminist theory propagates old essentialisms is thus epistemologically shallow. It remains locked into a literal acceptance of masculinist universalism, and often evolutionist attitudes about progress as well. As such, liberal feminism itself is essentialising, ideological, and conservative. But more importantly, when it censors ecofeminism, it becomes a 'wedge politics' hindering broad *alter-mondiale* alliances for social and environmental change.

The concept of embodied debt helps explain why both the sex and gender of people's bodies remains relevant even in an era of transgender emancipation.²⁸ In fact, the statistical record of violence on women should register as embodied debt, because in a capitalist patriarchal system, this violence is not simply sexual but economic. Women's International League for Peace and Freedom notes that in Russia, 14,000 women die annually as a

result of violence in the home. In the Sudan, systematic rape is used as a weapon of war. Social disruption stemming from rapid economic change, land reform, or harsh IMF imposed structural adjustment measures, also leads some men to thrash out in frustration. In the USA today, a woman is raped every four minutes. In Colombia, where 3.5 million people are displaced, most are women with children. World wide, women make up 80 per cent of those living in refugee camps.²⁹ Sex/gender violence, intimidation, and harassment is 'economic' because it ensures women's compliance in handing over resources like land, or working for meagre wages, or reproducing the next generation of labour with no compensation to their own lost 'opportunity costs' - biological, economic, and social costs. Since women globally are differently implicated in the use and nurture of natural resources, attention to this violence is central to research into - and action for - global justice and ecological sustainability. But WILPF reports that progress is very slow:

Since 1995 substantial work has been done to implement the Beijing *Declaration and Platform for Action* arising from the 4th UN World Conference on Women; 185 countries - more than 90 per cent of the UN member states - have now ratified the 1979 *Convention on the Elimination of All Forms of Discrimination Against Women* (CEDAW); and, United Nations Security Council adopted Resolution 1325 on *Women, Peace and Security* in 2000 ... Despite this recognition, violence against women is a reality that cuts across borders, wealth, race, religion and culture.³⁰

The meta-industrial labour class

In a recent book on the global North/South divide, Paul Collier, former head of development research at the World Bank and now Professor of Economics at Oxford, speaks about the failures of small nation states, eliding the fact that most of them are historical creditors of the North.³¹ And right now, the material flow from South to North looks like being exacerbated by policies like the EU's 'Global Europe: Competing in the World' program. In a statement of opposition to this aggressive neoliberalism, the Seattle to Brussels Network names those targeted for bi-lateral trade agreements and growth by deregulation as India, South Korea, the ASEAN states, Central America and the Andean Region, Russia, MERCOSUR countries, and the Gulf Cooperation Council. The Network sees the object of 'Global Europe' as access to natural resources, particularly energy reserves, as well as geo-political influence on former colonies. In the opinion of the Network, Economic Partnership Agreements (EPAs) for trade deals in African, Caribbean, and Pacific (ACP) countries, will destabilise the livelihoods of millions of people in the global South.

Global Europe poses a serious threat to social justice, gender equality and sustainable development, not only outside the EU, but also within. The erosion of workers' rights, the worsening of the quality of jobs within the EU, the destruction of a sustainable model of farming is also intrinsically linked to the external EU trade agenda ... EU policies based on so-called "competitiveness" and increasingly open and deregulated markets ... have lead to more insecurity, precarity,

deteriorating salaries and working conditions, deepening inequalities between countries, regions and between women and men. This strategy also puts under threat environmental and health regulations ... Farmers, and particularly small-scale women farmers, who simply cannot compete with powerful European agribusinesses, will be driven off their land.³²

The S2B Network adds that trade ministers, whose decisions reinforce unsustainable forms of production, are directly responsible for climate change.

The 'Global Europe' program illustrates the old axiom that economics is war by other means. And indeed, the Seattle to Brussels Network goes on to expose the EU's 'externalization of borders policy' and its preoccupation with detention and deportation.³³ So it is disappointing to encounter influential UN adviser Jeffrey Sachs, Director of the Earth Institute at Columbia University, by-passing this *real politik*. His BBC *Reith Lectures* promote further eurocentric expansionism, and when he talks of 'technology' as the foundation of economic development, the implication is distinctly Darwinist. For Sachs, the solution to the global crisis is not 'a massive cutback of our consumption levels or our living standards', but 'smarter living ... to find a way for the rest of the world ... to raise their own material conditions as well ...'³⁴ Sachs' vision is buoyed up by innovation in the business and professional sectors, thus:

In early February [2008], the United States National Academy of Engineering released a report on "Grand Challenges for Engineering in the 21st Century." ... The report, like the Gates Foundation's similar list of "Grand Challenges" in global health, highlights a new global priority: promoting advanced technologies for sustainable development.³⁵

But this missionary zeal fails to factor in all the cradle to grave operations of mining, smelting, transport, waste disposal, and their entropic costs. When these are comprehensively researched, as in the study by environmental sociologists Richard York and Eugene Rosa, ecological modernist expectations of sustainability are demonstrated to be quite unrealisable.³⁶ Beyond this, of course, an embodied debt remains to be registered.

Sachs certainly appreciates that there are environmental and social problems associated with provisioning by means of modern technologies, but is confident that genuinely dematerialising and foolproof solutions will be found. However, once the engineering is solved, a second set of complexities rolls in: the sociological dilemma of how to steer the juggernaut of unregulated economic growth.

We can harness safe nuclear energy, lower the cost of solar power, or capture and safely store the CO₂ produced from burning fossil fuels. Yet the technologies are not yet ready, and we can't simply wait for the market to deliver them, because they require complex changes in public policy to ensure that they are safe, reliable, and acceptable to the broad public. Moreover, there are no market incentives in place to

induce private businesses to invest adequately in developing them.³⁷

Is technological optimism, managerial flair, and business-as-usual enough to save the earth? If the standard of living of the global North was extended world wide, and its economic externalities fully acknowledged, the notional calculation of ecological debt from the degradation of soils and streams, or loss of plant and animal life, would be a phenomenal sum. - Consider the loss of metabolic fit as decomposing soil bacteria are killed off by depleted uranium in the Balkans and Middle East. Consider the loss of eco-sufficient pest control as ladybirds are killed off by factory emissions; each 'economic service' is worth millions of dollars. It is interesting to hear that UK economist Nicholas Stern, came forward at the Climate Change negotiations in Bali, 2007, with the message that rich countries must now make 'sharp domestic reductions' in consumption.³⁸ Stern is getting close to it: the ecofeminist call for 'capacity building and a reverse structural adjustment' in the consumerist North.

Plainly, there is still much to be learned from the late ecological economist Nicholas Georgescu-Roegen. And had this pioneering thinker lived in an era of gender literacy, he would surely have noticed how women are socially positioned at the humanity-nature interface, taking care of biological flows, catalysing matter/energy cycles.³⁹ Neither neoclassical economics, philosophy, nor socialism, has identified this counter-entropic work, let alone conceptualised its social context and value. This, despite the fact that global capital is thoroughly dependent on its regenerative metabolic transactions. Moreover, in the time-consuming daily negotiation of embodied livelihood, reproductive workers apply a life affirming economic rationality, demonstrating what professional economists and managers tend to abstract and glorify as 'complexity, multi-criteria valuation, and intergenerational modelling'. Such women, mothers especially, replace risk by precaution; they use a synergistic approach to needs; define development by health and sustainability; and they know that distribution and consumption actually stand closer to poverty than subsistence presumption does. It is important to look more closely at the features of this environmentally benign meta-industrial way of provisioning. The related themes of biological time and self reliance are taken up by ecofeminists such as Mary Mellor in her work on communality versus monetary exchange.⁴⁰

If the principle of eco-sufficiency is second nature to women's grassroots economic practices in many regions, it is all but absent in the master discourse. In 2006, the Sustainable Europe Research Institute, Finland Futures Research Centre, and other consultants, reported to the European Union that eco-sufficiency is the approach least often considered by the experts.⁴¹ The more popular policy measures include - 'ecological footprint, cradle-to-cradle assessment, dematerialisation, and transition management'. As a sustainability science, ecological economics is usually about quantitative efficiency rather than qualitative eco-sufficiency. The usual focus is how to optimise land use, or the productivity of material and energy throughput. The practice of eco-sufficiency departs from this functionalist closed-system reasoning and challenges corporate and government assumptions that 'more' of the same, must be 'better'. Eco-sufficiency bypasses consumerism and energy

wasting international markets. It rests on the logic of permanently reproducing the humanity-nature relation; it is a permaculture, to echo Australian ecologist Bill Mollison's practical vision.⁴²

'What is missing from the ecological modernisation agenda is a concern with sustainable consumption' says John Barry, an outspoken critic of the emphasis on 'resource efficiency'.⁴³ SERI et al illustrate this by citing the differential rates of consumption between global North and South as 10 to 1 respectively. They note too, that a policy based on eco-sufficiency would require a commitment to annual reductions in resource use by industrialised nations. In saying this, they anticipate a move towards global justice through structural adjustments in the North's consumption pattern. The benefit of such a policy for protecting the integrity of the global ecosystem is obvious, as is its reduction of ecological and embodied debts owed on women's labour and to peoples of the South. But eco-sufficiency might also benefit the North - and humans as much as nature. For high GDP is not consistently correlated with human satisfaction and health. The release of labour time following lowered material production might even enhance daily life in the North by reducing sex/gender frustration and violence. SERI et al add that an economics of eco-sufficiency might be adopted, 'To create a socially inclusive society by taking into account solidarity within and between generations and to secure and increase the quality of life of citizens as a precondition for lasting well-being'.⁴⁴ Eco-sufficiency is a strong sustainability, because it involves both metabolic fit with nature and transformations that reach down into the cultural fabric of socio-economic life. As ecological economists, SERI et al do not interrogate core social relations of production. But widespread moves towards eco-sufficiency and cultural autonomy would seriously destabilise the market.

Indeed, the European neglect of eco-sufficiency in sustainability science very likely reflects the fact that it threatens the neoliberal growth economy. But factory workers and professionals are just as locked into productivism as the business class is. There is also an unspoken sex/gender dimension in the commitment to mega-projects. The gatekeepers of economics are redolent with the competitive masculinist rhetoric of the nation-state and international financial institutions, not to mention the dissociated instrumental rationality that serves it. The tools of this top-down managerialism are all too often mathematical formulae based on observed physical indicators like - input/output models - material flow analysis - complex systems - probability distributions - decision theory - ecological services - green accounting - millennium assessments - risk monitoring and uncertainty reduction. Sabine O'Hara has remarked on the tacitly gendered division of labour in economics - so entrenched, that few practitioners can recognise the social and ethical implications of their methodologies. Introducing concrete examples of this problem, Marilyn Waring has explained just how measures like the UNSNA and ISEW are corrupted by the gendered power relations that shaped their formulation. Gigi Francisco and Peggy Antrobus have observed this blindness in international policy mainstreaming and in the Millennium Development Goals promoted by United Nations agencies.⁴⁵

As Derek Wall of the UK Green Party writes: 'Economics is, in many ways, the dominant discourse of modern and postmodern societies'.⁴⁶ Ecofeminists endorse that insight, highlighting both the masculinist and eurocentric aspects of economics. The hegemonic role of the discipline is exposed in apartheid like statements about human interaction 'with' nature - as if the ecosystem were a distinct 'other'. For the word 'with', implies that nature is a separate entity from 'man' - discontinuous from 'his' embodied human condition. This separation has a certain plausibility, since women over the centuries have been coopted to mediate nature for men in so many societies, and in this way, they express a consciousness of natural processes that most men have become alienated from. Thus, the first premise and deconstructive insight of an embodied materialism is that humans are themselves 'within' nature', and that social institutions and knowledges need to be reconstituted around that holistic reality. Too many ecological economists, environmental philosophers and sociologists - and even feminists, are hesitant to give up the old dividing line that represents relations between humanity versus nature reductively - as a dualism.⁴⁷ In fact, very few self-respecting scholars will dare blend humanity into its bio-geographic mix - as ecocentric deep ecologists have tried to do, for instance. Yet even then, deep ecologists opted for a safely, idealised subjectivity in nature - one where the practical burdens that women and other colonised peoples carry to keep white male privilege afloat - remained unrecognised.

Even in the journal of *Environmental Ethics* and the ecosocialist quarterly *Capitalism Nature Socialism*, most authors still deal with the humanity-nature transaction in a conventional two-sided way. But in reconstituting the Left and Greens as part of a globally inclusive movement, the facts behind embodied debt really need to become a central organising plank.

More than two-thirds of the world's unpaid work is done by women, the equivalent of \$11 trillion (approximately half of the world's GDP); Women make up 70 per cent of the world's poor and 67 per cent of the world's illiterate people - women still own just one per cent of assets worldwide ...⁴⁸

There is no doubt that after horsepower, women have been the cheapest form of energy for harnessing - and certainly easier to marshall than oil supplies. The material and energetic exhaustion of women under global capitalism ranges from sex slaves to paid prostitutes, to wives and mothers, to cash cropping farmers and piece workers, to domestic help, to factory and service workers. In the tradition of political economy, socialists and liberal feminists have pushed for a monetised solution - the equal inclusion of women in the formal or paid labour force.⁴⁹ This remains an essential station on the road to global justice, but it is not our terminus. The focus of an embodied materialist analysis is to create awareness of hitherto neglected sphere of metabolic labour ascribed to 'women and natives as part of nature'. This epistemological critique reframes an androcentric political economy as a gender literate political ecology, and spells out a new direction in movement struggles for global justice.

In the bigger picture, the monetisation of labour and of nature is embedded in corrupt relations of production, and for this reason, the present discussion of debt should not be confused with the nature accounting of the 'natural capital' school of Paul Hawken or Robert Costanza, for example. This approach by passes social relations and perpetuates capitalist patriarchal mythologies by describing nature as 'capital'.⁵⁰ True, Marx used the term 'variable capital' to describe human labour, but in doing this, he intended to demonstrate how the entrepreneur reasons. Today, when ecological economists speak about manipulating varieties of capital, it is clear that the object is to remedy, if not upgrade, the international market system. Costanza also favours government appointed trusts to 'manage the commons' - a notion that too comfortably assumes that governments can be trusted to be independent of business. His managed commons would include 'assets' such as - the atmosphere, water, airwaves, social networks, and cultures. This totalising technocratic vision collides headlong with the political meaning of autonomous people's commoning, a model drawn from places in the global South where earth, air, fire, and water, plant and animal life, are still ungoverned and freely shared.⁵¹

Existing ecosocialist theory also has limited relevance for sex/gendered and racialised labour trapped in a system of rampant commodification, but ecosocialists certainly do better than the liberal's 'natural capital' approach when it comes to *alter-mondiale* strategy. For one thing, an analysis of capital as a system of global accumulation helps people understand why they so often find themselves pitted against each other as separate political interest groups. Waged working-men in the North are made obsolescent by the introduction of new technology or fixed capital, or by offshore transfer of their jobs to dollar a day workers in the global South. Hence, capital divides and rules international labour, setting geographic and racialised fractions of the working class against each other. Again, some wage labourers lose their employment to women casual workers, or have their own jobs flexibilised. The components of production are varied expeditiously by corporate capital from one situation to another, just as the location of social externalities is a pragmatic decision. The neoliberal economist may regard such choices as innocent substitutions of one capital (human) for another (natural), but reading capitalist patriarchal production with an ecological feminist lens keeps the displacement of embodied debt in focus. According to Nalini Nayak, the mechanisation of fisheries in Kerala has benefitted local village men, while causing women to lose their livelihood. Ana Isla has demonstrated how the establishment of environmental conservation zones can result in displaced rural women turning to prostitution for survival. On the other hand, Leigh Brownhill and Terisa Turner show that Nigerian women's loss of food growing land to Big Oil, has lead them to become eco-warriors.

In the diverse matrix of social and natural relations, economic externalities evolve into political struggles between competing movements. Thus indigenous peoples whose foraging land is enclosed by a CDM order establishing it as an 'oxygen sink' for the global North, blame environmentalists for their loss. Middle class feminist animal right activists are attacked as myopic, by mothers in poor racialised communities fighting to

oust a toxic dump from their neighbourhood. But these tensions are simply by-products of an irrational system of accumulation where people and their surrounds are pulled in or thrown off at the convenience of a privileged elite. The engineering efficiency and legislated solutions advanced by some green thinkers and ecological economists, will not resolve such questions.

A number of ecological economists attend to the social contradictions of globalisation; and indeed, the assessment of Richard Norgaard's detailed and discerning study *Development Betrayed*, is that modernity is 'a shambles'. He might have added too, that modernity is gendered masculine, for he is aware of and agrees with ecological feminist views on the contemporary crisis. Others who draw their profession closer to the insight that its proper study is the social relations of production include - Manfred Max-Neef, Serge Latouche, Martin O'Connor, Joan Martinez-Alier, Ramachandra-Guha, and John Gowdy.⁵² Ecosocialist economists like Elmar Altvater, Roger Keil, and Paul Burkett, have also helped to historicise this very unselfconscious field of study.⁵³ But for the most part, practitioners of ecological economics and ecosocialism are yet to acknowledge the value of reproductive labours, let alone the ideas of women scholars. Only once these contributions are brought into ecological economic reasoning will old taken for granted constructs be exposed as inadequate.

In building an inclusive political ecology, there is much ideological debris to clear away. This externalist critique is carried forward by both 'feminist' and by 'ecological feminist' economists. The latter tend to pursue the political economic objective of establishing 'equality', for women in theory, methodology, and problem identification.⁵⁴ Conversely, ecofeminist economists are situated within political ecology. They dig down into the epistemological role of sex/gender, 'the principle of difference', in constituting the humanity-nature metabolism. Feminist economists will tend to stand on the anthropocentric side of the humanity-nature dualism, while materialist ecofeminists will be more ecocentric, concerned to explain how economic activities should fit inside an ecological frame.⁵⁵ This ideal-typical distinction in feminist theory is rather like the one drawn between 'environmental economics' and 'ecological economics'. Environmental economics, resting on the ontological separation of humanity versus nature, is about repairing capitalism, while ecological economics attempts (albeit still weakly) to transcend the ad hoc humanity versus nature divide. Of course, such polarisations are not hard and fast: individual thinkers can modify their attitudes over time.

Despite the degradation of land, water, biodiversity, and concomitant poverty in local communities, the application of ecological economics in policy rarely encourages eco-sufficiency or tackles the interlocking problems of ecological and embodied debt. Too many in the profession seek the 'scientific' status of mainstream positivism with its image of cool detached 'rigour', and so avoid contact with grassroots NGOs and their university of the earth.⁵⁶ Yet judging from the statements of leading thinkers at the 9th International Society of Ecological economics Conference in Delhi, it is clear that ecological economics is not monolithic but reflects all the conflicts of a complex global

society. Several of these thoughtful comments invite serious consideration. For instance, Robert Costanza urges colleagues to take a longer perspective on 'the human dimension' and 'the humanity-nature relationship'. John McNeill asks ecological economists to draw on 'history' in order to 'think more concretely, be grounded'. Arild Vatn talks about 'the socio-political embeddedness of the economy' and looks toward a 'social rationality' with 'inclusive-integrative institutions'. As Kanchan Chopra puts it, 'technological efficiency is not enough, we need a new development paradigm'. Helmut Haberl goes further, proposing 'a totally different type of societal organisation, a radical qualitative change'. And Jacqueline McGlade challenges her colleagues with: 'how do we bring it down to people's everyday life?'⁵⁷

A womanist perspective has much to offer these heartfelt misgivings, for no ISEE plenary speaker conceded the fundamentally sex/gendered character of their disciplinary constructs, methods, and problems.⁵⁸ Against neoclassical economics or even Marxian class analysis, an embodied materialist lens reveals a third party - bridging the economic and the ecological. Thus, a new generation of textbooks might be organised around the following heuristic schema:

The Meta-Industrial Economy

- economic discourse	'man - productive sector'
- agency / class	entrepreneurs, wage labour, slaves
- epistemology	reductionist, linear, stock focus
- benefit	exchange value (satisfaction for a few)
- cost (entropy x 3)	- exploitation of worker's surplus - global degradation of nature's metabolism - exhaustion of reproductive labour
- political action	for reflexive capacity, structural change
.....	
- <i>subliminal unspoken</i>	'woman/native - reproductive sector'
- agency / class	<i>meta-industrial carers, peasants, indigenes</i>
- epistemology	<i>relational, cyclic, flow focus</i>
- benefit	<i>use value, regeneration of biocomplexity</i>
- cost	<i>nil</i>
- political action	<i>for cultural autonomy, sex/gender justice</i>
.....	
- ecological discourse	'nature - thermodynamic sector'
- agency	matter/energy transfers via animals and plants
- process	relational, cyclic, flows
- benefit	metabolic value, organic reproduction
- cost	nil
- political action	for the commons, fit, eco-sufficiency

The triangulation is called for because by eurocentric reason, the condition of being human is always already differentiated by gendered 'productive' versus 'reproductive' lines. But when economists proceed as if humanity is a unity, they make essentialist theory and regressive politics. The consequence of blindness to the meta-industrial sector is externalisation - downward cost shifting and debt on to women, peasants, indigenous peoples; in short, the squandering of metabolic value.

The move from an acknowledgement of sex/gender difference in ecological economics to the reconceptualisation of analytic terms and procedures, begs an intervening dialogue with materialist ecofeminist colleagues and comrades. This conversation is open to environmental ethicists, World Social Forum activists, feminists, political ecologists, whoever agrees that the imposts of capitalist patriarchal accumulation are unacceptable. Such a conversation can aerate the familiar premises of political ecology by examining how it is that

- the crisis of democracy and sustainability originates in an unconscious sex/gendered politicisation of the human relation to nature, which becomes institutionalised by capitalist patriarchal economic practices,
- globally dominant economic and social institutions are built on the extraction of surplus value from workers, use value from colonised and bridled bodies, and metabolic value from nature at large,
- political ideologies and professional disciplines preserve this status quo in constructs and methodologies that are gendered to the core,
- a reflexive political ecology and ecological economics will examine the origin of all forms of debt - foreign, ecological, and embodied,
- the object of economic, political, social, and cultural transformation is a regenerative humanity-nature metabolism without social externalities.

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These propositions might inform an ecofeminist manifesto or a gender aware ecosocialist manifesto, or vice versa, a deep ecological manifesto grounded in a materialist analysis. In the first instance, it might guide professionals hoping to build a more comprehensive foundation for *ad hoc* and exclusionary disciplines. Academic researchers, political leaders, and movement activists need to work hand in hand with women North and South - prefiguratively - to learn about how eco-sufficiency and justice fit together. This is a necessary - though not sufficient preparation, for structural change on a global scale.

The recognition of embodied debt is justified by the fact that without regenerative labours - biological, economic, social - humanity could not exist. In the global South, most meta-industrial communities subsist graciously as well designed networks of prosumption; but this sustainable work needs an intact habitat, a means of production that is undisturbed by 'development' or

'conservation zones'. In the North, where livelihood is mediated by marketed commodities and services, landscapes and bodies are assaulted by intensive technological fallout. The medical burden of coping with electro-magnetic radiation, or heavy metals in water, is another facet of embodied debt. These externalities of capitalist patriarchal economics are generally left for care givers in the home to pick up in their own unwaged hours. In her discussion of neoliberalism, Ewa Charkiewicz talks of *homo sacer*, the unspoken category of humans who may be sacrificed with impunity for the sake of profit. We see them waiting at the bus stop, Meike Spitzner's single mothers with baby trolleys and plastic shopping bags. For Zohr de Ishtar, they are the Marshallese grandmothers who nurse children through cancer, while the US tests its nuclear arsenal on their island home. For Andrea Moraes and Ellie Perkins, use value and embodied debt is registered each time a Brazilian washerwoman carries buckets of water uphill to the *favela*.

By some quirk of reason, women are treated as equally culpable for climate change, though as 75 per cent of the world's poor, they may have no electricity, few consumer goods, and little time or money to spend on energy guzzling leisure pursuits. As global citizens they are indeed mainstreamed out of mind. Policy analyses by Francisco, Antrobus, Waring, O'Hara, Moraes and Perkins, offer immanent critiques of this status quo. Some readers may call their positions reformist, but the issues each author raises has profound theoretical implications for ecological economics, and beyond that political ecology. Antrobus' account of Millennium Development Goals amplified Federici's argument on the patriarchal control of women's fertility as an economic imperative. Waring's cost-benefit analysis of 'embodied resources' such as mothers' milk, offered a major conceptual challenge to an economics founded on the false categorical distinction between humans versus nature.⁵⁹ - A phenomenon like climate change must be tackled at the level of epistemology.

When Jacqueline McGlade asks how to 'bring' ecological economics 'down to people's everyday life', an ecological feminist response is that it is already down there. And more, that everyday people know what they are doing. Nevertheless, in a world where social structures are corrupted by derogatory mythologies of gender, race, and class difference, one should ask - in order to avoid the essentialism of bureaucratic management - 'Which people's everyday life exactly?' The global division of labour is such that professionals, middle class men or women, often become enclosed in a virtual world of abstract indicators and formulaic decision criteria. This material de-skilling has dangerous consequences and it leads ecological feminists to insist on the protection of cultural autonomy as prerequisite to the protection of biodiversity.⁶⁰ In the global North, G8 and World Bank circles, grassroots expertise is too readily 'consulted' then brokered out to corporations for economic gain.⁶¹ Indigenous creativity then becomes the thin end of the economic wedge for many communities. But even Left leaning political economists and socialist feminists operating by the principle of equality, have been keen to pull meta-industrial labour into the circuits of capital, a kind of eurocentrism that sells development as 'a human right'. The case for recognition of embodied debt spirals away from this monoculture. It is not an

argument for reproductive labours to be waged, just as the case for ecological debt is not literally about monetising the whole of nature's 'services' across the globe. Commodifying strategies such as these, like climate change solutions based on carbon trading, merely band aid an incoherent civilisation.

Increasingly, activists North and South demand that land, property, and resources be held as commons and that market excess and polluting trade give way to local production and exchange in reciprocity. These inspiring projects are found in uncommon places; for example, the new utopian communities of Ireland; the *Nayakrishi Andolon* of Bangladesh; the Dominican Green Sisters of New Jersey; the organic growers network of Lombardy; the Lesbian farm collectives of Oregon.⁶² The grassroots coalition Climate Justice Now! celebrates this worldwide shift from global to local provisioning. They observe how the global warming solutions put forward by financial institutions, corporations, governments, and development agencies, are yet further opportunities to profit by commodifying nature. In place of carbon offsets and agrofuels, the Coalition demands less consumption, redirected military spending, and debt cancellation. Like others in the movement of movements, they argue that justice for the global majority inheres in land rights and peoples' sovereignty over energy, land, food, and water.⁶³

An embodied materialist politics seeks global justice via the principle of difference rather than the principle of equality. Beyond simplistic evolutionist notions of forward and backward, progress and regress, meta-industrial labour models cultural autonomy and an alternative scientific knowledge base. The UN Human Development Index therefore, should be re-gearred to the concept of provisioning by 'metabolic fit' as the criterion of 'developed' capacity. Reparations by the global North for rough and ready colonisation maybe an economic response to ecological debt but is not an environmental one, because exchange value and metabolic value are entirely incompatible with each other. One helpful strategy could be meta-industrial 'capacity building' for the North, with the South assisting dysfunctional capitalist states to reset their economies on an eco-sufficient course. This 'epistemology of the South' can give direction and hope to teachers, researchers, and decision makers, trying to make sense of the 'shambles' of modernisation. Perhaps too, the *alter-mondiale* movement of worker, women, postcolonial, and ecological activists, will find a new political synergy through its common ground in meta-industrial labour?

¹ Shalmali Guttal, 'Corporate Power and Influence in the World Bank', *Focus on Trade*, 2007, No. 13, Online Available HTTP: <www.focusweb.org> (accessed 5 November 2007). For a classic statement on the economics of international debt: Susan George, *The Debt Boomerang*, London, Pluto Press, 1992.

² For example, Elizabeth Bravo and Aurora Donoso of *Accion Ecologia* in Ecuador, Online Available HTTP: <www.deudaecologica.org>; campaign reports by Leida Rijnhout, co-ordinator of the Flemish Platform on Sustainable Development, Online Available HTTP: <www.vodo.be> (both sites accessed 1 September 2007).

³ U Thata Srinivasan et al, 'The Debt of Nations and the Distribution of Ecological Impacts from Human Activities', The National Academy of Sciences of the USA, 2008, p.1, Online Available HTTP: <www.pnas.org/cgi/doi/10.1073/pnas.0709562104> (accessed 10 February 2008).

⁴ For a Marxist elaboration of this problem, see: Paul Burkett, *Marxism and Ecological Economics*, Leiden: Brill, 2006. Burkett is right to say that ecological economists tend to treat the market as a 'black box', failing to unpack the core relations of production which give rise to how nature is turned into social 'exchange value'. Nevertheless, most Marxists have another 'black box' when it comes to how these core relations of production are interlinked with sex/gender exploitation.

⁵ While it was the late President Eisenhower who first raised concern over the military-industrial complex, its sex/gendering is amplified by Women's International League for Peace and Freedom. To quote 'We can have one combat ship for the same cost of sending 6.8 million children to school in Afghanistan for 9 years ... 26,000 nuclear weapons, 'conventional' bombs, guns, cluster bombs and landmines, will not deter or remove the threat of a Tsunami, a hurricane, a flood, a virus, climate change or water shortage, the real security threats of our lives'. Felicity Hill, 'International Women's Day Disarmament Seminar, 5-6 March 2008', Online posting: <wilpf-news@wilpf.ch> (accessed 12 March 2008); also the Stockholm International Peace Research Institute, *SIPRI Yearbook 2007: Armaments, Disarmament, and International Security*, Oxford University Press, 2007; and on women's resistance to militarism, Cynthia Cockburn, *From Where We Stand*, London: Zed Books, 2007.

⁶ So it is that women still do 65 per cent of the world's work for less than 10 per cent of world wages. Anup Shah (2007) Global Issues website, Online Available HTTP: <www.globalissues.org/HumanRights/WomensRights> (accessed 25 November 2007). Biological sex is one thing, cultural gender is another, but the two interact in everyday life, and it is gender that politicises people's opportunities. Gender is like race and class in being '... a social construct that ascribes different qualities and rights to women and men regardless of individual competence or wishes'. Gerd Johnsson-Latham, *Initial Study of Lifestyles, Consumption Patterns, Sustainable Development and Gender*, Stockholm: Swedish Ministry of Sustainable Development, 2006, p. 6.

⁷ On embodied materialism: *ibid.*, pp. 164-66 and 175-78. This interrogation of 'labour' set out to find a political common denominator for the key activist movements of our time - ecological, worker, womanist, and postcolonial struggles. Also Ariel Salleh, 'Globalisation and the Meta-industrial Alternative' in Robert Albritton et al

(eds), *New Socialisms: Futures Beyond Globalization*, London: Routledge, 2004.

⁸ In using the word 'fit', I am inspired by Jessie Wirrpa, one of the Australian Aboriginal mentors of anthropologist Deborah Bird Rose, author of 'Fitting into Country', unpublished manuscript, CRES, Australian National University, 2007. At the same time, the idea of 'metabolic fit' speaks to Marx's observation of the 'metabolic rift' between town and country; an insight elaborated by John Bellamy Foster, *Marx's Ecology*, New York: Monthly Review, 2000. On the alienated sensibility that results from this rift, see: Peter Dickens, *Reconstructing Nature*, London: Routledge, 1995.

⁹ The interlinked notions of embodied debt, meta-industrial labour, eco-sufficiency, metabolic value, capacity building and reverse structural adjustment, should be treated as strategic categories, whose status remains to be debated.

¹⁰ For critical perspectives post-Kuhn, see: Sandra Harding, *Is Science Multicultural?*, Bloomington: Indiana University Press, 1998; Raewyn Connell 'Northern Theory: The political geography of general social theory', *Theory and Society*, 2006, Vol. 35, No. 2, 237-264.

¹¹ Chaone Mallory, 'Ecofeminism and Forest Defense in Cascadia', *Capitalism Nature Socialism*, 2006, Vol. 17, No. 1, 35-37. For a paradigmatic early statement of ecofeminist economics, see: Veronika Bennholdt-Thomsen and Maria Mies, *The Subsistence Perspective*, London: Zed Books, 1999.

¹² The meta-industrial labour thesis aligns with the dynamics of imperialism outlined by Rosa Luxemburg, *The Accumulation of Capital*, New York: Monthly Review, 1968. But the framing of my argument is also materialist in an embodied sense.

¹³ Walden Bello, 'The Environmental Movement in the Global South: The Pivotal Agent in the Fight Against Global Warming', *International Viewpoint*, 2007, No. IV394, Online Available HTTP: <www.internationalviewpoint.org> (accessed 5 November 2007); James Goodman, 'Climate change, development, aid and trade', Sydney: AidWatch Discussion Paper, 2007; Patrick Bond, 'The Third World in the Movement for Global Justice', *Against Global Apartheid*, London: Zed Books, 2003.

¹⁴ *Via Campesina*, 'Small Scale Sustainable Farmers are Cooling Down the Earth', 5 November 2007, Online Posting: <via-info-en@googlegroups.com> (accessed 5 November 2007).

¹⁵ Boaventura de Sousa Santos, *The Rise of the Global Left*, London: Zed Books, 2006.

¹⁶ Information on the European Commission's Knowledge-Based-Bio-Economy (KBBE) is Online Available HTTP: <www.europa.eu.int/comm/research/biosociety> (accessed 20 January 2008). See also Georgia Miller, 'Is Nanotechnology Rushing into a Repeat of the Biotechnology Backlash?', Online Available HTTP:

<www.newMatilda.com> (accessed 20 September 2006). The sale of nano commodities worth US\$32 billion in 2005 is expected to grow to US\$1 trillion by 2011. Nano-engineering of synthetic body organs, fuel cells, stain repellent fabrics, smart robotic drugs, and even foods, remakes matter at a sub-atomic level with unknown implications for human and ecosystem health.

¹⁷ South Peoples' Historical, Social-Ecological Debt Creditors' Alliance, *Quito Statement*, 22 August 2007, Online Posting: <ieetm@accionecologica.org> (accessed 5 November 2007).

¹⁸ Ana Elena Obando, 'Sexism in the World Social Forum: Is Another World Possible', WHRnet, 2005, Online Available HTTP: <www.iiav.nl/eazines/web/whrnet/2005/february/pdf> (accessed 6 November 2007). For an effort to overcome this problem, see: Onyango Oloo, 'Gendering WSF Nairobi 2007', Online Available HTTP: <www.Forumsocialmundial.org.br/noticias_textos.php?cd_news=327> (accessed 8 January 2007). There were also few women in the first definitive appraisal of the WSF phenomenon, Tom Mertes (ed.), *A Movement of Movements*, London: Verso, 2004. The balance is rectified in Judith Blau and Marina Karides (eds), *A Better World is Possible, Necessary: The World and US Forums*, Leiden: Brill, forthcoming.

¹⁹ Salleh (2007), op. cit., pp. 35-52. To reinforce the point: biological sex should not be understood dualistically; it covers a range of body types, not all of which are sexually reproductive. However, culturally imposed gender templates are dualistic. The labels 'masculine and feminine' indicate learned gender styles. Women may be dominated through both physical sex and by gender role, which is why the term sex/gender is used in this text.

²⁰ The original statement was Mathias Wackernagel and William Rees, *Our Ecological Footprint: Reducing Human Impact on the Earth*. Gabriola Island, BC: New Society, 1996. The quote is Online Available HTTP: <www.footprintnetwork.org> (accessed 20 April 2007).

²¹ Gerd Johnsson-Latham op. cit., points out that even in the global North, women have a remarkably lower ecological footprint than men. Whereas men tend to shop for durable assets like computers, houses, or boats, women mainly shop for weekly necessities, nature's perishables. The difference is even more striking when it is appreciated that women's consumption is mostly made on behalf of others, that is, family members.

²² The United Nations Framework Convention on Climate Change, 1994, Article 3, Online Available HTTP: <www.unfccc.int/resource/docs/convkp/conveng.pdf> (accessed 10 May 2007).

²³ To rectify this, the European Union commissioned a comprehensive transnational report see: European Parliament, *Women and Transport in Europe*, Brussels, 2006, Online Available HTTP: <www.europarl.europa.eu/EST/download.do?file=9558> (accessed 10 May 2007).

²⁴ Selma James founded the Wages for Housework campaign in the 1970s and today it is particularly strong in Venezuela, Online Available HTTP: <www.globalwomenstrike.net> (accessed 1 September 2007). A global women's strike is a valuable consciousness raising tactic. For socialist feminists, it is as a step towards getting women's reproductive labours waged. From an ecofeminist perspective, its exposure of embodied debt points to the need for a profound reformulation of humanity-nature relations, a shift from thinking in terms of exchange value and use value, to metabolic value.

²⁵ For responses to critics see Salleh in note 48.

²⁶ For a refutation of liberal feminist objections, see: Phoebe Godfrey, 'Dianne Wilson vs Union Carbide: Ecofeminism and the Elitist Charge of "Essentialism"', *Capitalism Nature Socialism*, 2005, Vol. 16, No. 4, 37-66.

²⁷ Liberal feminists occasionally converge with conservative economists who refer to women's reproductive labour as 'social capital', for instance, Robert Putnam (ed.), *Democracies in Flux: The End of Social Capital in Contemporary Society*, Oxford University Press, 2002. Putnam examines society as a functional machine, with women neatly accorded a 'moral role' within the system. Liberal feminists object to the moral role aspect, but have often embraced the notion of women's 'social capital'.

²⁸ Some activists in the Lesbian-Gay-Bi-Transgender (LGBT) movement have criticised ecological feminists on the basis that the old dualist sex/gender model is passe. In terms of contemporary lifestyle options, this may be so, at least for some individuals, but traditional gender assumptions remain firmly embedded in social structures and in economic concepts. Consider the United Nations System of National Accounts, which deems biologically and socially reproductive activities to be 'non-labour'. A materialist ecological feminism is not about 'identity politics' but about the economic effects of historically reified gender structures and positions that limit people's life opportunities. Old fashioned words like 'men' and 'women' cannot be avoided in the process of deconstructing corrupt global institutions.

²⁹ Women's International League for Peace and Freedom, WILPF Statement on the International Day for the Elimination of Violence Against Women', Online Available HTTP: <www.wilpf.int.ch> (accessed 25 November 2007).

³⁰ Ibid.

³¹ Paul Collier, *The Bottom Billion: Why Poor Countries are Failing and What Can Be Done About It*, Oxford University Press, 2007.

³² Seattle to Brussels Network, 'No to Corporate Europe - Yes to Global Justice: Statement for the World Social Forum's Global Day of Action, 26 January 2008', Online Available HTTP: <www.s2bnetwork.org> (accessed 1 February 2008).

³³ Ibid. Seattle to Brussels Network members include: Actionaid International, *Action Solidarité Tiers Monde*, Africa-Europe Faith and Justice Network, Anti-Globalisation Network UK, Attac, Berne Declaration, Both Ends, *Campagna per la Riforma Della*

Banca Mondiale, Christian Aid, *Coordination Paysanne Européenne*, *La Via Campesina*, Corporate Europe Observatory, *Ecologistas en Acción*, *Fédération Syndicale* Food and Water Watch Europe, *For Velferdsstaten*, Friends of the Earth, Global Roots, Greenpeace International, *Institut pour la Relocalisation de l'Economie*, Institute for Agriculture and Trade Policy, *Initiative Colibri*, Nature Trust Malta, New Economics Foundation, *Norsk Bonde-Og Smabrukarlag*, Oxfam Solidarity, People & Planet, ¡*Prou OMC!*, *Rete Lilliput*, Center For Research on Multinational Corporations, *Terra Nuova*, The Corner House, Third World Network, Transnational Institute, Protect the Future, *Vredeseilanden*, War On Want, WEED, WIDE - Women In Development Europe, WILPF, Working Group against the MAI.

³⁴ Jeffrey Sachs, 'Lecture I: Bursting at the Seams', 11 April 2007, *BBC Reith Lectures*, Online Available HTTP: <www.bbc.com.uk> (accessed 20 April 2007).

³⁵ Jeffrey Sachs, 'Technology Cooperation', *Project Syndicate*, 2008, Online Available HTTP: <www.project-syndicate.org> (accessed 6 March 2008).

³⁶ Richard York and Eugene Rosa, 'Key Challenges to Ecological Modernization Theory', *Organization & Environment*, 2003, Vol. 16, No. 2, 273-88.

³⁷ Sachs (2008), op. cit.

³⁸ Tom Athanasiou, 'Where Do We Go From Here? The Bali Meeting and the Lessons Learned', *Focus on Trade*, 2007, No. 135, December, Online Posting: <focus-on-trade@lists.riseup.net>. Another cautionary tale is offered by Bello op. cit.. In capitalist China, a new 'user pays' high tech medical system has resulted in the resurgence of diseases like tuberculosis. Whereas TB is eradicated in Cuba, whose health care delivery is based on the sufficiency of the 'barefoot doctor' concept.

³⁹ Nicholas Georgescu-Roegen, *The Entropy Law and The Economic Process*, Cambridge, MA: Harvard University Press, 1971. See also Kolya Abramsky, 'Energy and Labor in the World-Economy', *Capitalism Nature Socialism*, forthcoming, which offers an excellent political economic analysis of energy circuits under capitalism.

⁴⁰ Community based challenges to growth economics have a proud history, see: Molly Scott Cato and Miriam Kennett (eds), *Green Economics: Beyond Supply and Demand*, Aberystwyth: Green Audit, 1999; another route is via the North American Left Biocentrism network of David Orton and friends, Online Available HTTP: <www.home.ca.inter.net/~greenweb/> (accessed 1 September 2007).

⁴¹ Report by the Sustainable Europe Research Institute, UN University, and Finland Futures Research Centre, *Environment and Innovation*, Vienna: Tender No. IP/A/ENV1/ST/2005-84, 2006. Sustainability science has 'hard and soft' versions. The present eco-sufficiency argument endorses the Friibergh position. Online Available HTTP: <www.earthethics.com/sustainability%20science.htm>

⁴² Bill Mollison, *Permaculture: A Designers' Manual*, Tyalgum, NSW: Tagari Publications, 1988.

⁴³ John Barry, 'Towards a Concrete Utopian Model of Green Political Economy', *Post-Autistic Economics Review*, 2006, No. 36, 1-18, Online Available HTTP: <www.paecon.net> (accessed 21 January 2007).

⁴⁴ SERI et al op. cit. In addition: Frieder Otto Wolf, Pia Paust-Lassen, and Joachim Spangenberg, *Sustainability Politics and the EU SDS: A Synthesis Model*. TNW: *Improvement of sustainability strategy elaboration for economic, environmental and social policy integration in Europe*, Berlin: HPSE/CT/2002/50019 -1, 2006. See also the refreshing stance of IUCN Resolution 3.075: 'Applying the Precautionary Principle in Environmental Decision Making and Management', World Conservation Congress, Bangkok, 2004. Here the precautionary principle is interlinked with three others - public participation in decision making, intra and intergenerational equity, common but differentiated responsibility. Online Available HTTP: <www.iucn.org> (accessed 8 January 2008).

⁴⁵ For instance, UNDP, *Human Development Report*, New York: United Nations, 2001. On how the Millennium Development Goals help preserve capitalist patriarchal economics: George Caffentzis, 'Dr. Jeffrey Sachs' *The End of Poverty: A Political Review*', *The Commoner*, 2005, No. 10, Online Available HTTP: <www.thecommoner.org> (accessed 31 October 2006).

⁴⁶ Derek Wall, 'Green Economics: An Introduction and Research Agenda', *International Journal of Green Economics*, 2006, Vol. 1, No. 2, 201-213, p. 202.

⁴⁷ See Ariel Salleh, 'Deeper than Deep Ecology' in Baird Callicott and Clare Palmer (eds), *Environmental Philosophy* Vols. 1-5, London: Routledge, 2005; Ariel Salleh (2006) 'Social Ecology and The Man Question' in Piers Stephens, John Barry, and Andrew Dobson (eds), *Contemporary Environmental Politics: From Margins to Mainstream*. London: Routledge, 2006; and the symposium, Ariel Salleh (ed.), 'Ecosocialist-Ecofeminist Dialogues', *Capitalism Nature Socialism*, 2006, Vol. 17, No. 4, 32-124.

⁴⁸ WILPF, Women and Human Rights seminar, Online Available HTTP: <www.wilpf.int.ch/events/2008IWDseminar.html> (accessed 23 January 2008).

⁴⁹ For a solid socialist position on justice for women, specifically exploited migrant labour: Jerry Mead-Lucero, 'Domestic Workers Emerge as a New Front in the "Non-Traditional" Labor Movement', *Labor Notes*, October 2007, 3-4. But this article begs the question of where unpaid housewives fit into the socialist picture or women traded internationally as sex slaves. On the latter, see: Nancy Holmstrom (ed.), *The Socialist Feminist Project: A Contemporary Reader in Theory and Politics*, New York: Monthly Review, 2002; Mary John Mananzan, *The Woman Question in the Philippines*, Manila: Institute of Women's Studies, 1997.

⁵⁰ Paul Hawken, Amory and Hunter Lovins, *Natural Capital*, New York: Little Brown, 1999; Robert Costanza, 'Review of Peter Barnes' *Capitalism 3.0*', *Nature*, 2007, No. 446, 613-614. Compare the critique of eco-managerialism by Tim Luke, 'The System of Sustainable Degradation', *Capitalism Nature Socialism*, 2006, Vol. 17, No. 1, 99-112.

⁵¹ On the commons, see: Massimo de Angelis, 'Neoliberal Governance, Reproduction and Accumulation', *The Commoner*, 2003, No. 7; Ariel Salleh, 'Sustainability and Meta-industrial Labour: Building a Synergistic Politics', *The Commoner*, 2004, No. 9, Online Available HTTP: <www.thecommoner.org> (both accessed 31 October 2006).

⁵² Richard Norgaard, *Development Betrayed*, New York: Routledge, 1994; Manfred Max-Neef et al, *Human Scale Development*. New York: Apex, 1991; Serge Latouche, *In the Wake of the Affluent Society*, M. O'Connor and R. Arnoux (trans.), London: Zed Books, 1993; Joan Martinez-Alier and Ramachandra Guha, *Varieties of Environmentalism*, London: Earthscan, 1997; John Gowdy (ed.), *Limited Wants, Unlimited Needs*. Washington, DC: Island Press, 1998.

⁵³ Elmar Altvater, 'Global Order and Nature' in Roger Keil et al (eds), *Political ecology: Global and Local*, London: Routledge, 1998; Richard Westra, 'Green Marxism and the Institutional Structure of a Socialist Future' in Robert Albritton et al (eds), *Political Economy and Global Capitalism*, London: Anthem Press, 2007; Burkett, op. cit. See also Joel Kovel and Michael Lowy, 'An Ecosocialist Manifesto', *Capitalism Nature Socialism*, 2002, Vol. 13, No. 1, 1-2, 155-57; and Joel Kovel, *The Enemy of Nature*, London: Zed Books, 2002, which book acknowledges the political relevance of ecological feminist analysis.

⁵⁴ For a brief overview: Geoff Schneider and Jean Shackelford, 'Ten Principles of Feminist Economics: A Modestly Proposed Antidote', Online Available HTTP: <www.paecon.net> (accessed 5 November 2007); and for a gentle, nuanced feminist critique: Julie Nelson, *Economics for Humans*, University of Chicago Press, 2006.

⁵⁵ For instance, Dianne Rocheleau et al (eds), *Feminist Political ecology: Global Issues and Local Experiences*, New York: Routledge 1996, adopts a Left liberal or socialist feminist framework rather than an ecocentric one. Likewise, Luciana Ricciutelli et al (eds), *Feminist Politics, Activism and Vision: Local and Global Challenges*, London: Zed Books, 2004, takes an anthropocentric gender and justice focus, without going into the epistemology of women-nature linkages.

⁵⁶ An exception here is Joan Martinez-Alier, who as Chair of the International Society of Ecological economics, has been proactively bridging ISEE and global NGOs.

⁵⁷ Anna Chiesura, 'Ecological economics for What?', *International Society of Ecological economics Newsletter*, 2007, January, 9-11, Online Available HTTP: <www.ecoeco.org> (accessed 21 January 2007).

⁵⁸ After writing this, I came across Wendy Harcourt, *Feminist Perspectives on Sustainable Development*, London: Zed Books, 1994, and it is disturbing that so few practitioners of ecological economics have heard what she pointed out years ago.

⁵⁹ Some ecological feminists are researching alternatives to the capitalist patriarchal model in existing matriarchal societies, see: Heide Göttner-Abendroth, *Das Matriarchat I: Geschichte seiner Erforschung*, Stuttgart: Kohlhammer, 1988;

Genevieve Vaughan (ed.), *Women and the Gift Economy: A Radically Different Worldview is Possible*. Toronto: Inanna, 2007.

⁶⁰ Beyond the reasons offered here, eloquent arguments for a culturally autonomous economics are made by Gustavo Esteva and Madhu Suri Prakash, *Grassroots Postmodernism*, London: Zed Books, 1998; Patrick Cuninghame, 'Reinventing An/Other Anti-capitalism in Mexico' in Werner Bonefeld (ed.), *Subverting the Present, Imagining the Future: Insurrection, Movement, Commons*, New York: Autonomedia, 2007.

⁶¹ The medicinal Neem tree is a case in point, although this particular corporate patent on indigenous knowledge was reversed after an internationally organised people's court challenge, see: Vandana Shiva, *Earth Democracy*, Boston: South End, 2006.

⁶² Liam Leonard, 'Sustaining Ecotopias: Identity, Activism and Place', *Ecopolitics*, 2008, Vol. 1, No. 1, 105-155, Online Available HTTP: <www.ecopoliticsonline.com> (accessed 7 February 2008); Farida Akhter, 'Resisting Technology and Defending Subsistence in Bangladesh' in Veronika Bennholdt-Thomsen, Nicholas Faraclas, Claudia von Werlhof (eds), *There Is An Alternative: Subsistence and Worldwide Resistance to Corporate Globalization*, London: Zed Books, 2001; Sarah McFarland Taylor, *Green Sisters: A Spiritual Ecology*, Cambridge, MA: Harvard University Press, 2007; *Associazione Donne in Campo via Lombardia*, Piazza Caiazzo, Milan; Rachel Stein (ed.), *New Perspectives on Environmental Justice: Gender, Sexuality and Activism*, New Brunswick: Rutgers University Press, 2004.

⁶³ Climate Justice Now! Media Release: 'What's Missing from the Climate Talks? Justice!', Bali, 14 December 2007, Online Posting: <focus-on-trade@lists.riseup.net>. Members of this coalition include: Biofuelwatch, Carbon Trade Watch, Transnational Institute, Center for Environmental Concerns, Focus on the Global South, Freedom from Debt Coalition Philippines, Friends of the Earth International, Gendercc - Women for Climate Justice, Global Forest Coalition, Global Justice Ecology Project, International Forum on Globalization, Kalikasan-Peoples Network for the Environment, *La Via Campesina*, Durban Group for Climate Justice, Oilwatch, Pacific Indigenous Peoples Environment Coalition, Aotearoa, Sustainable Energy and Economy Network, The Indigenous Environmental Network, Third World Network, *WALHI* Indonesia, World Rainforest Movement.