Ariel Salleh, 'From Eco-Sufficiency to Global Justice', in A. Salleh (ed.) *Eco-Sufficiency & Global Justice: Women write Political Ecology*. London: Pluto Press, 2009.

The relevance of ecological feminism to ecological economics was acknowledged quite early on by figures as eminent as Martin O'Connor, Ramachandra Guha, Joan Martinez-Alier, Bina Agarwal, and Richard Norgaard.[1] Agarwal supported its relevance in a postcolonial context, pointing to women's skill in traditional agriculture and medicine, and how socially constructed care giving roles are compromised when peasant and indigenous women lack property. Ecofeminism is indeed, an 'environmentalism of the poor', and even in the global North, women, as a result of their regenerative labours, experience kinds of poverty and pain that are unknown to men.[2] This is why Veronika Bennholdt-Thomsen and Maria Mies recommend a methodology of working with the 'view from below',

> … to demystify the delusions created by those 'on top' that their life and lifestyle are not only the best possible ones but also the image of the future for everybody on this planet … [In fact] the so-called good life is possible only for a minority and … [enjoyed] at the expense of others: of nature, of other peoples, of women and children.[3]

At this stage, mainstream economics, and much ecological economics, by conceptualising what is meaningful to men with eurocentric leanings, works with a 'view from above'. Economics as a sustainability science deals merely with the tip of the productivist iceberg, while the greater part of economic transfers between humans and nature are not even named.

Towards that naming, this essay will compare an ecological economics guided by abstract market indicators, with models of provisioning that engage with ecological integrity. Too much of what passes for economic expertise today, is so decontextualised as to be inaccurate. Worse, the professional advice itself, is marketed as a commodity. A plethora of policy 'measures' exist to mitigate climate change, biodiversity loss, chemical or nuclear emissions, but taxes and subsidies, green engineering, and bioethical formulae, simply stitch up an incoherent neo-liberal system tailored to individual gain. Sociologists have various theories about how capitalist production has disconnected humanity from nature. Peter Dickens identifies the alienated consciousness as an inevitable outcome of the capitalist industrial division of labour.[4] John Bellamy Foster sees diminished human capacity for ecological understanding as a corollary of the 'metabolic rift' between town and country. Corporate globalisation now multiplies and magnifies this rift across the face of the earth. It is certainly true that the more technologically mediated life tasks are, the more people lose a psychological sense of their own organic interchange with nature. Silvia Federici uses the word 'amnesia' to describe this loss of knowledge - and environmental abuse is an expression that interior splitting.[5]

But this dissociated instrumental rationality has not colonised every part of the globe. People in many locations do understand their material embodiment in nature, and they know how to practice eco-sufficiency.

A foundational thinker in ecological economics, Nicholas Georgescu-Roegen, was seriously committed to seeing humans meet their needs in an ecologically sound way. In contrast to neoclassical and even Keynesian convention, he brought an awareness of biological systems and the thermodynamic principles that apply to them into economic reasoning.[6] However, to be fully adequate to the task, an ecological economics - just like green political theory or environmental ethics - will draw on the conceptual lenses of psychology, sociology, political, and cultural studies too.[7] The latter especially, can enrich the professional imagination in the search for alternatives to the growth paradigm. Beyond these inputs again, stands the sex/gendered depth analysis or 'bioenergetics' introduced by an embodied materialist analysis.[8] Currently, in ecological economics 'embodied energy' refers to exosomatic fuel and the quantity of it invested in the life cycle of a product from manufacture, through transport, to consumption. In ecological feminism, embodied energy refers to subjective or endosomatic energy flows, through human labour, sexuality, and generative nature at large. Clearly, such an idea has the potential to make a profound intervention in what Donella Meadows dubbed the 'pre-analytic vision' of ecological economics.[9]

The difference between an externalising or 'scientistic' perception of natural energy and an embodied one is apparent in this extract from *Wikipedia*:

> Natural capital can be considered the planetary endowment of scarce matter and energy, along with the complex and biologically diverse ecosystems that provide goods and services directly to human communities: micro- and macro-climate regulation, water recycling, water purification, storm water regulation, waste absorption, pollination, protection from solar and cosmic radiation, etc.[10]

Here 'scarcity' appears as an ontological constant rather than a man made anomaly; and living systems are projected as effectively 'dead matter' or capital, potentially commodifiable goods and services. There is little sense of active human co-evolution - rather, it is 'the planet' (not women's bodies, for instance) that endows the system with human resources. The extract bypasses the historically gendered, class, or racialised context of economics leaving the objectifying capitalist patriarchal vocabulary of human and natural capital unexamined. Now of course, *Wikipedia* is not academia, but it does reflect the state of play. The psychology of externalisation is assisted by all kinds of quantifying devices, and this, in the face of overwhelming evidence of regional, temporal, and other empirical incommensurabilities in the economic field. Another typical distancing technique is projection of the economy as 'an engine'. For Robert Costanza, the machine runs on four kinds of measurable capital - built, human, social, and natural, all readily substituted one for another in production. The achievement of human satisfaction or Quality of Life (QOL) depends on getting the balance of system components right.[11]

Costanza and colleagues translate the holistic work of Chilean economist Manfred Max-Neef into a number crunching North American QOL study as follows:

> We split off [*sic*.] a new category titled 'reproduction' from Max-Neef's subsistence category ... acknowledging the importance of reproduction has significant policy implications particularly regarding women and their role [*sic*.] in society.[12]

Why should reproductive activities be 'split off' from subsistence? And why should reproductive activities be split off 'as women's role'? Men are quite capable of regenerative forms of labour and the life affirming epistemology learned from doing them. For example, the meta-industrial provisioning of peasants or gatherers, demonstrates an economic model that synergises the satisfaction of human needs with enhanced metabolic flows in nature.

All this said, ecological economists are opening up the positivist hegemony in many ways; and artificially imposed divisions of men versus women, and humans versus nature, are being challenged. Consider the progressive moves made over the years by the celebrated ecological economist Herman Daly. Alongside the canon of economic efficiency, he has introduced 'environmental sustainability and social justice' as key objectives of the discipline.[13] Alongside GNP, he has advocated the Genuine Progress Indicator (GPI). Alongside, chrematistics, he has reminded us that the origin of the word economics is *oikos*, the study of households, with the ecosystem being like a human household writ large. Beyond short-term productivism, Daly recognises that biological time and reproduction is slower than economic time or production, and that intergenerational equity will call for thinking with a long time horizon. Beyond economic reductionism, Daly endorses transdisciplinarity, methodological triangulation, and the democratic principle of subsidiarity.[14] Yet in other respects, the conservative functionalist heritage of neoclassical economics is still active beneath Daly's approach, and these elements may sometimes cancel out its more progressive implications. The mandatory mathematical modelling is there. And the focus on 'sustainable scale', 'just distribution', and 'efficient allocation' as core processes resonates all too easily with the happy consciousness of green business and its 'triple bottom line'.[15] The three core variables of - scale, distribution, allocation - operate within an ad hoc system, whose imaginary boundaries are never justified by the economist. Using the abstract language of systems theory and cybernetic analogies, this ecological economics reifies 'the economy' much as the old the 'hidden hand' of market liberalism has done. And while scale, distribution, and allocation, are discussed within the rationalist framework of bureaucratic instrumentalism, the objective of top-down manageability looks all too similar to a 'god's eye view' in secular guise. A major defect of systems analysis is that economic functions are described in the passive voice, so creating a sense of anonymity and inevitability. The approach hides differences of power between classes, races, genders, and deflects people's belief in their own capacity for taking responsibility.

A related problem is the idealism that characterises Daly's treatment of value as 'psychic benefit'. Moreover, the discussion tends to proceed in an essentialist way, as if these benefits would be the same for executives and indigenes, or for mothers and fathers.[16] Decision-making parameters like 'marginal benefit' versus 'marginal opportunity cost' also operate in an ahistorical vacuum without a socially specified subject. This ostensibly neutral methodology inadvertently sanitises patterns of distribution and allocation as objective mechanisms. In reality, distribution and allocation are the outcome of decisions made by specific kinds of subject (usually white middle class men) over the life circumstances of apparently lesser humans, the de facto objects of the global North (women everywhere, peasants and indigenes in the South). When the social subject of an analysis is omitted, it reads as if, an ideal typical and intrinsic 'human nature' is involved. By contrast, the transdisciplinary economist might discuss scale, distribution, and allocation, in a way that is more finely attuned to class, ethnicity, gender, and species differences. The key questions would be: Who is it that decides on scale? Who distributes to whom? Who is entitled to make allocations? And: Why? Criticism aside, Daly is a leader among those ecological economists who define 'human capital' and 'natural capital' as interlinked. By destabilising the conventional dualism of humanity and nature as separate spheres of reality, this work begins to shift an assumption traditionally used by a eurocentric civilisation to justify political domination in all its forms. But the transformative potential of ecological economics remains latent as long as sociological bias in its analytic tools passes unnoticed. True, at professional conferences, it is now mandatory to include sections on peasant and indigenous societies, and to host a feminist symposium. But are these treated merely as 'add-ons' to round out the pluralism of an enlightened hegemony? Are these marginal strands basically seen as 'problem areas', examples of distributional conflicts, or 'externalities' waiting to be assimilated to the master-map of ecological economics?

Reproductive labour as leverage

What if the suggestion were made that in building an alternative and truly global political ecology, ecological economics, or environmental ethics, it is just these problematic marginals - house holders, peasants, indigenes - who can model social justice and sustainability for the twenty-first century?[17] Where would such a claim fall in the discourse of ecological economics? Would it entail a move too far beyond the comfort zone of its nascent knowledge base? Are mothers or hunter-gatherers too 'negatively constructed', 'dependent' or 'deviant', as Daly et al might explain, in relation to the exercise of power, 'the power to name' and the power to theorise? Guha and Martinez-Alier have provided ecological economics with a magisterial review of environmental politics among peasant communities. And John Gowdy, a student of Georgescu-Roegen, defends the rationality of indigenous provisioning practices.[18] But will it be up to ecological feminists, largely outside of the discipline, to flag the value of an embodied materialist epistemology and women's practical leadership in sustainability science?

The task certainly calls for a deconstruction of conventional wisdom. For instance: if 'scarcity' is a pivotal notion in capitalist patriarchal economics, so 'incapacity' is pivotal to its psychology of domination. As the standard line goes, too many women, the majority of the world's poor, are hopeless victims of masculine violence and exploitation; while peoples of the global South must soon fall under the 'inexorable' wheel of 'modernisation and progress'. This is why neoliberal criteria of success, such as individualistic emancipation and market participation for women, export-led development for peasants, and eco-tourism for First Nation Peoples, are promoted as attractive deals. The UN, WB, G8, and WTO, and quite a few ecological economists, are concerned to see the so-called poor grasp 'the first rung of the development ladder'; but the other side of this coin is corporate entrapment, with decimation of meta-industrial labour and livelihood resources. George Caffentzis writes that in development discourse, 'extreme poverty' has two contradictory meanings; either 'that households cannot meet basic needs' or cannot achieve 'an income of $1 per day per person'. Thus, the hypothetical pauper would live on 'the "goods and services" that can be bought for $1 a day in the US'. But, Caffentzis reminds us, there are also viable non-monetary economies out there.

> There are many villages where "basic needs" of their residents as they conceive them are satisfied, but whose collective income is less than $365 a year per person ... in many villages in Africa adults (including, in certain areas, women) have *access to* (although *not ownership of*) land that they can use for subsistence. This is an enormous wealth ("use value") that cannot be alienated and hence does not have an "exchange value." ... Similar points can be made about children. In many parts of Africa, children are "shared" by villages or extended families and their actual income is below $1 a day per person. These children often have their "basic needs" satisfied in a collective manner.[19]

Under the UN development model, common land, water, biodiversity, labour, and loving relationships, are pulled away from an ecologically sustainable and culturally autonomous web of self-sufficiency. By the North versus South, 1/0 logic, modernisation means that people must be turned into 'human capital' and their life resources turned into 'natural capital' (primarily to benefit an international minority class of entrepreneurs and its governmental hangers-on).[20] For centuries, communities from Africa to Oceania to South America and beyond, have confronted this appropriation in struggles to control their own local resources. Are ecological economists on their side? Or does the discipline unwittingly, by default, support the colonising mindset with its effects in ecological and embodied debt?

Today, there is alarm in international sustainable development circles about rising consumption and emission levels as India and China develop to 'the standard of living' of the global North. But turning the sociological spotlight

around, a Swedish government report for instance, concedes that in the year 2000 each Swede ate almost 40 kg of food more than 10 years ago and 30 kg more than the European average. The EU consumed more than the whole of Asia put together.[21] Meanwhile, the industrial states with an ecological footprint that spans 80 per cent of world resources, continues to blame populations at the periphery for environmental degradation introduced by the export of their own 'metabolic rift'. Given this context, the proposition that care-giving women, small farmers or gatherers, are skilled ecological economic managers may prove hard to get across. The suggestion may threaten privileges enjoyed by global business and academic elites. Furthermore, the notion of meta-industrial competence is intellectually demanding, because it involves two apparently competing political principles - 'equality and difference'. As things stand, Daly's objectives of 'environmental sustainability, social justice, and economic efficiency' are extrapolated from the principle of equality within the given economic order. But is this kind of nip and tuck enough, if the social relations of production on which this order rests are fundamentally unjust relations?

Applying the principles of equality and difference calls for a socio-cultural awareness that is unevenly developed in the transdiscipline of ecological economics. The principle of 'difference' may seem counter intuitive in a closed hegemonic system, because it signals the incapable 'other' of the capitalist patriarchal mindset. Additionally, in dealing with 'otherness', political ecologists and ecological economists may encounter what seem like conflicting positions within the feminist and postcolonial literature. But here, the scholar needs to bear in mind just who is speaking. Liberal feminist and uncritically productivist Left analyses will reason in favour of emancipation through the industrial paradigm based on an equitable re-distribution of the social product. But as far as political ecology goes, neither of these political standpoints makes thermodynamic sense as far as the protection of metabolic value is concerned. That is why ecological feminists maintain that the eco-sufficient sphere of regenerative labour and use value is more important for economics than the sphere of production for exchange. Ecofeminists who adopt this approach include Maria Mies, Vandana Shiva, Mary Mellor, and myself.[22] It is a standpoint grounded in labour - not for instance, an ideological or sociobiological argument about women being 'closer to nature' or 'better than men'. Nor as a historical thesis, is ecofeminism a celebration of idealisms like 'the essential feminine' or 'the noble savage', as defensive development studies academics might assert.[23] An embodied materialist epistemology is based on the day to day experience of negotiating humanity-nature relations. So too, it refutes the self-comforting liberal contention that affluence and post-materialist values are what give rise to environmental consciousness.[24]

An embodied materialism

An embodied materialism encapsulates interactions between habitat, sex, race, governance, science, ethics - an uneasy complexity for stochastic processing! Economists are comfortable measuring what they call 'productivity' but have a

hard time accounting for 'reproductivity'. Yet if Georgescu-Roegen's insights were to be honoured consistently, his hybrid practitioners would go straight to the energetics of regenerative cycles. The question is: Who in ecological economics has such knowledge to bring to the table? This is where the ethos of a 'post-normal science' is salient, for the condition of post-normalcy is that domain assumptions must be permanently under consensual review.[25] With such an exercise in mind, Meadows was well ahead of her time in claiming that ecological economics needs a conceptual 'leverage point'. My own response is to suggest that the notions of meta-industrial labour as regenerative and metabolic fit as eco-sufficiency, can provide this conceptual leverage.[26]

What follows is an analysis of how meta-industrial provisioning achieves eco-sufficiency based on a phenomenological reading of three exemplars.[27] The first is Vandana Shiva's case study of Indian forest dwellers, a statement of co-evolution and regenerative agency in conditions of scientific complexity. As she writes:

> It is in managing the integrity of ecological cycles in forestry and agriculture that women's [re]productivity has been most developed and evolved. Women transfer fertility from the forests to the field and to animals. They transfer animal waste as fertilizer for crops and crop by-products to animals as fodder. This partnership between women's work and nature's work ensures the sustainability of sustenance.[28]

Similarly, Australian Aboriginal and South East Asian hunter-gatherers, in their deliberative manual work, practice a kind of 'systemic holding', nurturing sustainability as they move through country.[29] In this most efficient and eco-sufficient of bioregional economies, the seasonal walk through country is made in the knowledge that with insightful harvesting, each habitat will replenish and provide again on the return. As Gowdy notes: the efficiency of the hunter-gatherer is marked in the fact that he or she rarely uses up more matter/energy in resources than is needed for bodily provisioning.

Turning to meta-industrial labour in urban economies, German ecology activist Ulla Terlinden spells out the tacit epistemology behind household reproduction.

> Housework requires of women [or men] a broad range of knowledge and ability. The nature of the work itself determines its organization. The work at hand must be dealt with in its entirety ... The worker must possess a high degree of personal synthesis, initiative, intuition and flexibility.[30]

Contrast this close empirical engagement with the fragmented industrial division of labour - the numb inconsequential mindset of the investor or assembly line operative. In the context of parental skills, US philosopher Sara Ruddick discusses 'holding' labour, as a manifestation of principles that clearly parallel good ecological reasoning, if not governance.

> To hold means to minimize risk and to reconcile differences rather than to sharply accentuate them. Holding [by a man or woman] is a way of seeing with an eye toward maintaining the minimal harmony, material resources, and skills necessary for sustaining a child in safety. It is the attitude elicited by world protection, world-preservation, world-repair ... [31]

While minimising risk in the face of material uncertainty, meta-industrial holding is the ultimate expression of adaptability. And while science as usual is marred by the positivist separation of fact and value, space and time, a cautious awareness of interconnection is commonsense in this embodied materialism. Ironically perhaps, the exacting empiricism of meta-industrial labour, its inbuilt 'reality testing', compares favourably with the most stringent standards of scientific falsificationism.

The regenerative labour of indigenes, mothers, and subsistence workers has many methodological features which facilitate metabolic fit.

- The consumption footprint is small because local resources are used and monitored with daily care by the provisioner.
- Scale is intimate and hands-on, maximising responsiveness to matter/energy transformations.
- Judgments are built up over time by trial and error, a cradle to grave assessment over an intergenerational time horizon.
- This means that meta-industrial labour is intrinsically precautionary.
- Lines of responsibility are transparent and accountable - far from the tyranny of small decisions that impairs bureaucratised economies.
- As local social structures are less convoluted than modern industrial ones, there is opportunity for synergistic problem solving.[32]
- In domestic and farm settings, multi-criteria decision-making is essential.
- Regenerative work patiently reconciles human time with unpredictable, non-linear timings in nature.[33]
- This is an economic rationality that knows the difference between stocks and flows.
- It is an autonomous and empowering work process, without a division between the worker's mental and manual skills.
- The labour product is not alienated but immediately enjoyed or shared.
- Meta-industrial provisioning is eco-sufficient because it does not externalise costs through debt or entropy.

A number of these observations converge with Daly's interest in economic scale.[34] However, while Daly conceptualises economics and ecology as essentially about 'household functions', and while he will impute monetary

value to 'ecological services provided by nature', women's domestic work remains un-valued. Similarly, in the context of the Two Thirds World, Daly's tri-partite functions of scale, distribution, and allocation, also beg a second look. Distribution and allocation either become irrelevant or take a very different form where eco-sufficient provisioning is practiced among communities who own land, water, and biodiversity in common, and where an ethic of cooperative labour has survived the onslaught of individualistic 'development'. Martinez-Alier has also argued this point and it underscores the parochial origins of ecological economics in eurocentric modernity. On the other hand, as the study of political economy is transformed into political ecology, the concept of a meta-industrial class is both integrating and politically inclusive. Women and men from all societies undertake reproductive labour - economic, cultural, and biological - at some stage in their lives. Increasingly though, with modernisation, reproduction as an economically invisible, non-valued, non-monetised, process is avoided - at least by most men, and the handful of women who get to feel like winners for a while under the capitalist patriarchal regime.

Capacity building for the global North

Ecological economists who are not so introspective about the cultural context of their discipline, may find the present critique counter-intuitive. But the idea of 'human capital' can too readily become a sex/gender blind notion - just as the idea of 'the worker' was in early twentieth century Marxism. Productivist terminology papers over the complex of reproductive 'services' provided by women. Without a tool of leverage like 'meta-industrial labour', the intricate thermodynamic contribution of household caregivers can be passed over. Racialised blindness around the work of forest dwellers is a related problem. When labour is ideologically 'naturalised' by gender or race, it becomes non-human, a free resource, an instance of embodied debt. The old humanity versus nature dualism is still a pervasive myth in the dominant culture and in its academic disciplines. Thus it is one thing to acknowledge, as Georgescu-Roegen did, that ecological economics must be rooted in the materiality of ecology and its matter/energy flows. It is another thing to see how ecological economics itself, is a practice fuelled in a subjectively bioenergetic or psychological sense. That is to say, a scholar's own class, race, or gender will to some extent determine what is plausible as a construct or method. Knowledge is always situated. And of course, if one is not personally disempowered by race or gender, it is easy to miss their significance. This could possibly explain why a massive study of global consumption undertaken in 2004 by the World Watch Institute failed to break down sex/gender differences in patterns of consumer behaviour. It may also help explain why some people keep saying that 'there are no alternatives' when so many others in the world already practice eco-sufficiency. As Nick Faraclas says: 'the alternatives are everywhere'.[35] And as Caffentzis adds:

> ... there is no automatic reason why people who have "escaped the poverty trap" through decommodification of basic needs and the development of their commons will necessarily rush to sell their labor-power to the first capitalist offering a wage.[36]

To realise eco-sufficiency and global justice, the most effective 'millennial goal' will be to give back the land taken away from people in the name of 'development'.

The call for conceptual leverage in ecological economics is highlighted by Julie Nelson's observations on the self-referential tendency of the professional mainstream. This shows up as a

> Preoccupation with status quo - Operating with a chronic assumption that the future will be much like the past.
> Dedication to simplified interpretations - Relying on highly simplified characterization of human behaviour and highly aggregate analysis.
> Sensitivity to disciplinary boundaries - Staying within rational choice modeling boundaries, neglecting most information from other disciplines.
> Commitment to rigidity - Encouraging loyalty to accepted models, no matter how dysfunctional they become.
> Deference to established hierarchy - Maintaining image of mainstream economists, whose work is peer reviewed by like-minded economists, as sole rational policy advisors.[37]

Nelson contrasts this closed in-house knowledge making with what she calls 'high reliability organisations' where decision making power is always given to those with most expertise - regardless of rank. Nevertheless, the frequency of citations to post-normal science in the ecological economics literature indicates that many practitioners are indeed, beginning to examine the social construction of their basic assumptions. And they are asking: Who speaks this analysis? What is my interest in formulating problems in the way I do? What entitles me to theorise? This kind of reflexivity can help open the paradigm of economics to voices and values of the global majority. But whereas the dialogic of post-normalcy seems to adopt a liberal-pluralist standpoint, with all positions equivalent to all others, an embodied materialism is not relativist but anchored in what works to protect metabolic value - the ecological bottom line.

At the 2002 World Summit on Sustainable Development in Johannesburg, the 'other' experience of care givers worldwide, small farmers, and First Nation Peoples, was presented as 'cultural not economic'. It was located outside the mainstream - the white middle class masculine government and UN agency discourse of sustainability science. At Davos, the World Economic Forum of global capitalist leaders continues this subterfuge. But WEF discourse is now dual powered by World Social Forum meetings at Porto Alegre, Mumbai, Nairobi. Additionally, the losers under capitalist patriarchal globalisation are in the streets from Cochabamba to Budapest to Sydney, and setting up conferences and websites to contest WTO and G8 policies. This historical turning point began at the Seattle Peoples' Caucus in 1999. In a meeting convened by the Indigenous Environmental Network USA/Canada, Seventh Generation Fund USA, and others, they told the world:

> … we believe that it is also us who can offer viable alternatives to the dominant economic growth, export-oriented development model. Our sustainable lifestyles and cultures, traditional knowledge, cosmologies, spirituality, values of collectivity, reciprocity, respect and reverence for Mother Earth, are crucial in the search for a transformed society where justice, equity, and sustainability will prevail.[38]

In order to support what these *alter-mondiale* activists are saying, political ecologists, green thinkers, ecological economists and other caring people, might focus on three interweaving goals:

- *Ecological Sustainability*: protecting the material/energetic interdependency of species, sex/genders, and generations,

- *Socio-Economic Justice*: protecting metabolic value and the sovereignty of common livelihood,

- *Cultural Autonomy*: protecting 'difference' and the diversity of economic and social practices.

The more complex and technologically developed a society becomes, the harder these political objectives are to reconcile. But as I have argued here, an autonomous reproductive labour class, marginal to the neoliberal economy, is well equipped to teach this synergy. In many postcolonial contexts, meta-industrial models remain intact; and already women and men in the global North are setting up their own alternative economies in bioregional networks, spiritual farming communes, local community gardens, and organic markets.[39] As ecological economists reflect on Daly's formula for 'environmental sustainability, social justice, and economic efficiency', some may see sense in replacing his category of efficiency by 'cultural autonomy'. For 'efficiency' is meaningless if the international economic system itself is internally contradictory. It is surely a good time now, for professionals and global justice activists to sit down and talk together, and for both to talk with people who have a developed capacity for eco-sufficiency. But in this, there is a respectful caveat to observe too; as Australian Aboriginal activist Lilla Watson put it:[40]

> If you have come to help me, you are wasting your time. But if you have come because your liberation is bound up with mine, then let us work together.

[1] Martin O'Connor (ed.), *Is Capitalism Sustainable?,* New York: Guilford, 1994; Ramachandra Guha and Joan Martinez-Alier, *Varieties of Environmentalism*, London: Earthscan, 1997, pp. 33-34; Bina Agarwal, 'The Gender and Environment Debate: Lessons from India', *Feminist Studies,* 1992, Vol. 18, No. 1, 119-158; Richard Norgaard, *Development Betrayed,* New York Routledge, 1994.

[2] For the universality of women's exploitation, see: Marilyn Waring, *Counting for Nothing*, Sydney: Allen and Unwin, 1988, thoroughgoing gender critique of the UN System of National Accounts (UNSNA).

[3] Veronika Bennholdt-Thomsen and Maria Mies, *The Subsistence Perspective*, London: Zed Books, 1999, p. 93.

[4] Peter Dickens, *Reconstructing Nature*, London: Routledge, 1995; and for an extended account of metabolic rift, see: John Bellamy Foster, *Marx's Ecology*, New York: Monthly Review, 2000. The humanity-nature metabolism is the harmonious process by which humans take what they need from nature, digest, and give back in return. Marx observed that industrialisation and the rise of cities created a 'metabolic rift' in this thermodynamic reciprocity, with environmental degradation an inevitable result. Refer also to my essay 'Ecological Debt: Embodied Debt' in this anthology.

[5] Silvia Federici, 'Women, Land-Struggles and the Valorization of Labor', *The Commoner*, 2005, No. 10: www.thecommoner.org (accessed 5 October 2006); Silvia Federici, *Caliban and the Witch*, New York: Autonomedia, 2004; Ariel Salleh, 'Body Logic: 1/0 Culture' in *Ecofeminism as Politics,* London: Zed Books, 1997,

[6] Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process,* Harvard University Press, 1971.

[7] Clive Spash, 'The Development of Ecological Thinking in Economics', *Environmental Values*, 1999, Vol. 8, No. 3, 413-35.

[8] On ecofeminist energetics: Salleh, op. cit., pp. 150-169; Vandana Shiva, *Staying Alive: Women, Ecology and Development*, London: Zed Books, 1989; Teresa Brennan, *Exhausting Modernity*, London: Routledge, 1997.

[9] Donella Meadows, 'Places to Intervene in a System', *Whole Earth Magazine*, 1997, Winter, Online Available HTTP: <www.wholeearthmag.com/ArticleBin/109.html> (accessed 31 October 2006).

[10] Wikipedia, 'Ecological Economics', *Wikipedia: The Free Encyclopedia,* Online Available HTTP: <www.wikipedia> (accessed 30 October 2006).

[11] Robert Costanza et al, 'Quality of Life: An Approach Integrating Opportunities, Human Needs, and Subjective Well Being', *Ecological Economics*, 2006, Vol. 61, No. 2, 267-76. 'Quality of Life is defined as: 'the interaction of human needs and the subjective perception of their fulfillment, as mediated by the opportunities available to meet the needs', p. 270.

[12] Costanza, op. cit., p. 271. Compare Manfred Max-Neef et al, *Human Scale Development,* New York: Apex, 1991.

[13] For a recent contribution: Herman Daly, Jon Erickson, and Joshua Farley, *Ecological Economics: A Workbook for Problem Based Learning*, Washington: Island Press, 2005.

[14] On subsidiarity: ibid., p. 202.

[15] On the tri-partite model: ibid., p. 6, 26.

[16] On psychic benefits: ibid., p. 38. Compare Linda Kaloff and Terre Satterfield (eds), *The Earthscan Reader in Environmental Values*, London: Earthscan, 2005; Peter Soderbaum, *Ecological Economics*, London: Earthscan, 2000.

[17] On 'meta-industrial' provisioning and 'embodied materialism': Salleh op. cit, pp. 164-66 and 175-78; Ariel Salleh, Globalisation and the Meta-Industrial Alternative' in Robert Albritton et al (eds), *New Socialisms: Futures Beyond Globalization*. London: Routledge, 2004. From an embodied materialist perspective, the unique rationality of meta-industrial labour - by peasants, indigenes, and household caregivers - is a capacity to provision eco-sufficiently, without causing ecological and embodied debt.

[18] Guha and Martinez-Alier, op. cit.; John Gowdy (ed.), *Limited Wants, Unlimited Means: A Reader in Hunter-Gatherer Economics and the Environment*, Washington: Island Press, 1998; Serge Latouche, *In the Wake of the Affluent Society: An exploration in post-development*, M. O'Connor and R. Arnoux (trans.), London: Zed Books 1993.

[19] 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).

[20] Rosa Luxemburg's insight into how capitalism cannot maintain its profits without colonisation and subsumption of the periphery has influenced several materialist ecofeminists, particularly Maria Mies, *Patriarchy and Accumulation on a World Scale*, London: Zed Books, 1986.

[21] Gerd Johnsson-Latham, *Initial Study of Lifestyles, Consumption Patterns, Sustainable Development and Gender*, Stockholm: Swedish Ministry of Sustainable Development, 2006, p. 6.

[22] For materialist ecofeminism, see: Maria Mies et al, *Women: The Last Colony*, London: Zed Books, 1988; Mary Mellor, *Breaking the Boundaries*, London: Virago, 1992; Shiva, op. cit., Salleh, op. cit.; Federici, op. cit.

[23] For an exchange over ecofeminism versus 'equality' developmentalism: Ariel Salleh, 'An ecofeminist bioethic: and what post-humanism really means', *New Left Review*, 1996, No. 217, 138-147. Recently, the ecofeminist case for cultural autonomy appears as a liberal appeal for 'cognitive justice', see: Shiv Visvanathan, 'Knowledge,

justice and democracy' in M. Leach et al (eds), *Science and Citizens*, London: Zed Books, 2005.

[24] Ronald Ingelhart, *The Silent Revolution* Princeton University Press, 1977. Likewise, when a notion like 'intrinsic value' is introduced into ecological economics, it is important that it should be a materially grounded construct: see John Proops, 'Ecological economics: Rationale and Problem Areas', *Ecological Economics*, 1989, Vol. 1, No. 1, 59-76

[25] Silvio Funtowicz and Jerome Ravetz, 'Post-Normal science: environmental policy under conditions of complexity', 2004, Online Available HTTP: <www.nusap.net> (accessed 12 November 2004). This in turn, builds on Thomas Kuhn, *The Structure of Scientific Revolutions*, University of Chicago Press, 1962.

[26] 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 speaks to Marx's 'metabolic rift', Bellamy Foster, op. cit.

[27] The present discussion adapts and builds on work by Salleh, cited in note 17.

[28] Shiva, op. cit., p. 45. See also the subsistence perspective in Bennhold-Thomsen and Mies, op. cit., and Hilkka Pietila, 'Cultivation and Households: The Basics of Nurturing Human Life', *Encyclopedia of Life Support Systems*. Oxford: UNESCO / EOLSS, 2004. The standpoint is supported by contemporary science, for example: Catherine Badgley et al, 'Organic Agriculture and the Global Food Supply', *Renewable Agriculture and Food System*s, 2007, Vol. 22, No. 1, 86-108. The authors note that: 'Model estimates indicate that organic methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population ... while reducing the detrimental environmental impacts of conventional agriculture', p. 86.

[29] Deborah Rose, *Nourishing Terrains: Australian Aboriginal Views of Landscape and Wilderness*, Canberra: Australian Heritage Commission, 1996.

[30] Ulla Terlinden, 'Women in the Ecology Movement' in E. Altbach et al (eds), *German Feminism*, Albany: SUNY Press, 1984, p. 320.

[31] Sara Ruddick, *Maternal Thinking: Toward a Politics of Peace*, Boston: Beacon, 1989, p. 75.

[32] On the term 'synergistic', see Max-Neef op. cit., and to paraphrase his thesis: Self-managed indigenous economies may synergistically satisfy many needs at once. They are not only environmentally benign, but creatively social. Besides subsistence, they foster learning, participation, innovation, ritual, identity and belonging. A high quality of life can be enjoyed on three hours work a day. By contrast, the engineered satisfiers of industrial societies like bureaucracies or cars, cost much energy and time, sabotaging the convenience they were designed for.

[33] Barbara Adam, *Timescapes of Modernity: The Environment and Invisible Hazards*, London: Routledge, 1998.

[34] On scale: Daly op. cit., p. 19, 124.

[35] Nicholas Faraclas, 'Melanesia, the Banks, and the BINGOs: Real Alternatives are Everywhere (Except in the Consultants' Briefcases)' in Veronika Bennholdt-Thomsen, Nicholas Faraclas, and Claudia von Werlhof (eds), *There Is An Alternative: Subsistence and Worldwide Resistance to Corporate Globalization*, London: Zed Books, 2001.

[36] Caffentzis, op. cit.

[37] Julie Nelson, 'Economists, Value Judgements, and Climate Change', Global Development and Environment Institute, Working Paper 2007, No: 07-03, Tufts University, Medford, MA. p. 10.

[38] *Tebtebba* Foundation, 'Indigenous Peoples' Seattle Declaration on the Third Ministerial Meeting of the World Trade Organization', Seattle, 8 December 1999, Online Posting <*tebtebba*@skyinet.net>.

[39] The literature on meta-industrial alternatives is extensive. See among others, essays by Gustavo Esteva, Farida Akhter, Helena Norberg Hodge, Christa Muller, and Elisabeth Meyer-Renschhausen in Bennholdt-Thommsen et al, op. cit.; the North American Left Biocentrism site, Online Available HTTP: <www.home.ca.inter.net/~greenweb/> (accessed 1 September 2007); experimental projects reported in Liam Leonard (ed.) Special Issue on Utopias, *Ecopolitics*, 2008, Vol. 1, No. 1, Online Available HTTP: <www.ecopoliticsonline.com> (accessed 7 February 2008); and Rachel Stein (ed.), *New Perspectives on Environmental Justice: Gender, Sexuality and Activism*, Rutgers University Press, 2004; Ted Trainer, *Abandon Affluence!*, London: Zed Books, 1987.

[40] This often quoted remark by Lilla Watson is widely believed to have been first made at the World Conference to Review and Appraise the Achievements of the UN Decade for Women in Nairobi, 1985.