CLIMATE STRATEGY: MAKING THE CHOICE BETWEEN ECOLOGICAL MODERNISATION OR LIVING WELL

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The idea of Living Well (buen vivir) introduced at the Peoples' Climate Summit in Cochabamba 2010 sets up a rhetorical contrast between high energy polluting economies of the industrial 'North' and low carbon eco-sufficient provisioning models in the global 'South'. The North's ecological modernising approach to sustainable development serves mainly to advance international capital, while, climate mitigation through market mechanisms and technology transfer imposes more costs than benefits on the global South. The model of development currently advanced through the UN Framework Convention on Climate Change (UNFCCC) breaks down local ecosystems and sustainable economies; locks communities into control by overseas business interests and multilateral bureaucracies; undermines cultural diversity and autonomy. In order to shift this complex of historical processes, climate activists will need to look very closely into the choice between a strategy of ecological modernisation and a strategy of Living Well.

Strategy 1: Ecological Modernisation

Since the stalled Copenhagen Climate Summit (COP15) in December 2009, governments, international agencies, and activists continue to proffer economic remedies for ecological ills. The mainstream discourse of political economy simply has no vocabulary for the material metabolism by which biological processes sustain human societies - and this silence has a long history. As Carolyn Merchant observed in her seminal study *The Death of Nature* (1980), the rise of European science marked a conceptual shift from organism to machine in the modelling of

nature and society. The mindset can be heard when the German Federal Minister for Environment (Bundesministerium für Umwelt, 2006) outlines his vision of the future global economy as a clockwork, whose parts tick over in perfect harmony.

> The lynch pin of a model of sustainable development has to be a 'third industrial revolution', at the centre of which is energy and resource efficiency ... If China becomes the 'world's workbench', India casts itself as the 'global service provider', Russia develops into the 'world's filling pump', and Brazil as the 'raw materials warehouse' and 'global farmer' - provides Asia's industrial and service companies with iron ore, copper, nickel and soybeans; Germany should then assert and strengthen its position in the global division of labor as 'the responsible energy-efficient and environmental technician' ... (Delheim, 2007: 9-11).

Beneath this perfect man-made economic machine, nature is dead, merely a 'raw materials warehouse'. It is therefore no surprise that global climatic patterns fail, as living ecosystems are subjected to this anthropocentric vanity.

The Minister's crude blend of neoliberal economics, technological innovation, and environmental sentiment typifies the popular ideology of ecological modernisation - common among government bureaucrats and establishment academics. Leading proponents of ecological modernisation, Arthur Mol (2000) and David Sonnenfeld (2009) still assume that capitalism can be made sustainable. Other sociologists, notably Richard York and Eugene Rosa (2003) point to the illusory features of ecological modernisation - most salient of these is the fact that its management constructs operate in a thermodynamic vacuum. In the push for 'resource efficiency', ecological modernisers externalise production costs on to the living bodies of others, then on to green nature or habitat down the line. Thus in the eurocentric vision of a 'third industrial revolution', Germany as 'the responsible energy-efficient technician' is really living on credit, buoyed up by an increasing ecological debt for nature in the global South, a social debt to exploited factory workers, and an invisible embodied debt to women as re-productive labour worldwide (Salleh, 2009a).

As neoliberal governments and quasi-policy agencies like the Intergovernmental Panel on Climate Change (IPCC) prevaricate over global climate solutions, the transnational ruling class is reluctant to let

go of its wealth, privilege, and control. Climate deniers and catastrophists alike insist that 'there is no alternative' to Brundtland's (1987) environmental stewardship via economic growth and 'trickle down'. Al Gore's sustainable America plan is full-on economism, but bankrupt ecologically. He envisages Congressional incentives to support solar, wind, and geothermal spots in the deserts of the US South West. A national low-loss underground grid would be built; there would be plug-in hybrid cars; retrofitted buildings; and household conservation advice. Gore would replace the Kyoto Protocol with a treaty that caps carbon emissions ready for trading. However, looking at the real material bottom line, the construction of new high tech cities in the US South West will consume vast amounts of front-end fuels - in mining metals, welding turbines and grids, road making, water supply, component manufacture for housing, air conditioning for supermarkets and schools (Astyk, 2008). Here is another mortgage - borrow now, pay later - an ecological debt whereby another biodiverse ecosystem will be spent. In this false green conversion, poor and marginalised communities from the populous US East Coast will weather the psychological costs of mass resettlement. Meanwhile, the new solar urbanisation will mean a loss of food growing land, possibly to be replaced by US agricultural leases in Central America. How then will the newly landless subsistence peasants of Mexico or Costa Rica survive? And how much climate pollution will be generated by long haulage of produce back to US consumers?

Are neo-Keynesian proposals the way to solve climate change? Or is it simply capitalist collapse that is mitigated by marketing green technologies and listing green jobs? The *Transatlantic Green New Deal* from World Watch (2009) and the Boell Foundation is another economic response to the ecological crisis. The authors cite the Millennium Environmental Assessment to the effect that 60 per cent of global 'ecosystem services' have been destroyed since World War II. But the epistemological implications of treating dynamic organic processes as 'infrastructures' are not questioned; nor are the cultural consequences of intensive commodification spelled out. The cultural integrity of peoples in Asia, Africa, or South America is annulled as their land and livelihood is given over to development through gas guzzling, trade dependent production regimes. But the cultural self-awareness required to recognise such imposts is rare among contemporary professionals (Hajer, 1996). A commitment to the global economy as perfect mechanism relies on externalising problems, displacing difficulties, passing costs on to others.

Thus, World Watch names 'population' as a major cause of environmental degradation, and in fact, the climate debate has brought old style environmental talk about population back into fashion. This removes the need to examine capitalist overproduction and consumption - mostly in the industrialised North, by placing responsibility for climate destabilisation on to politically voiceless women - mostly in the global South. Yet what kind of arithmetic is involved in this correlation between emissions and population? If 60 per cent of humanity is responsible for only 1 per cent of carbon emissions - why talk about population?

The Australian green new deal is known as the *Joint Statement* (ACF et al., 2009). It is put together by the Australian Conservation Foundation, Australian Council of Social Services, Australian Council of Trade Unions, Australian Green Infrastructure Council, the Climate Institute, Institute of Superannuation Trustees, and the Property Council. The wider social constituency of Women's Electoral Lobby or indigenous organisations is missing from the consortium. This may explain why the orientation to climate change solutions reinforces productivist entrepreneurial values - with retrofitted buildings and audits to enhance energy and water efficiency; sustainable transport infrastructure and renewables to reduce the carbon footprint. The Joint Statement advocates a new economic sector of green industries for the manufacture of globally competitive product innovations and services. This promises 500,000 green jobs, with re-skilling for Australian trades men and women. There is no engagement with the grassroots movement call to reconfigure 'the social contract' and no sense of Australians as ecological citizens with responsibilities that are global in reach. The technocratic focus also marks UNEP's *Global Green New Deal* (2008), which is essentially a 'development' model where people become 'human capital' and their habitat is quantified as 'natural capital'. By this reckoning, common land, water, biodiversity, labour, and loving relationships are pulled away from an autonomous web of eco-sufficiency.

In the 20th century language of ecological modernisation, what UNEP calls 'the service value of nature' is estimated at a trillion dollars higher than profits generated by the international automobile industry. Moreover, if nature is 'natural capital', UNEP notes 'the flip side of the coin' will be massive benefits to be had from 'the green technological revolution' and the 'huge untapped job potential' of managing 'nature based assets'. Thus, in Mexico and in Brazil, thousands of people, whose livelihood was previously independent of capital are now forced to

abandon their autonomy to the logic of exchange value. They are paid to manage watersheds, in order to secure a resource held in reserve for future commodification - like bottled water - described by one corporate executive as a 'human right'. UNEP's eurocentric green model deepens the subsumption of nature, instead of exploring an alternative society-nature metabolism resting in the time-tested expertise of farmers in the global South (Regenvanu, 2010). UNEP wants to avoid impacting on low income and indigenous groups, but its economic reasoning too often means the enclosure of marginal lands, the creation of refugees, and absorption of self-reliant resilient local economies into global capitalism.

The International Trade Union Congress (ITUC, 2010) is also ecologically modernising in its approach to climate politics. It emphasises UN agency initiatives and financing 'to help the poorest of the world to adapt to climate change'. However, financial allocations and loans, ultimately fix people into dependency on the global capitalist system; they may achieve a kind of economic repair but not environmental repair. The machinery of mainstream economics and the living organisms of ecology inhabit two separate material orders. Money can buy technologies, but these in turn do not mend broken metabolic cycles in nature. In fact, by the EROEI formula (Energy Returned on Energy Invested), the manufacture and operation of renewables demands yet further resourcing of nature, albeit out of sight, 'somewhere else', (Heinberg, 2009). Thus the policies of the UN Framework Convention on Climate Change (UNFCCC) are circular and self-defeating in terms of sustaining environments. Schemes such as the Clean Development Mechanism (CDM) and Reduction of Emissions by Deforestation and Degradation (REDD) deal with carbon pollution from industrial nations by funding 'carbon sinks' or polluter offset opportunities in tropical forests. At the same time, the affluent North continues to generate more industrial pollution by manufacture of 'renewables' to sell to the global South for 'climate adaptation'. This kind of self-serving gesture is legitimised in the name of 'development'.

The UN's ecological modernisation ideology is hinged on development, that is to say, on the assimilation of communities to the capitalist economic system. But since the conventional development model is what is responsible for climate destabilisation in the first place, it is inconsistent to speak of climate mitigation and development in the same breath. To its credit, the ITUC recognises the need for a new development model,

> ... for developing countries not to repeat the mistakes of the past but to engage instead in a different development path, so as to help build the low carbon, climate resilient and socially-fair world we need (ITUC, 2010).

What is missing though, is an acknowledgement that so-called 'developing countries' in the global South have been on a sustainable low carbon path for thousands of years. It is colonisation that spread what Marx called 'metabolic rift', damaging ecosystems and appropriating people's livelihood resources for the manufacture of profitable commodities (Foster, 2000). Trade union thinking, is embedded in this history and tends to assume there is no other way to achieve economic provisioning. Thus, despite the call for a new model, the ITUC climate statement clearly envisages the continuation of industrialisation. In this future deal, capitalist and worker are united in their commitment to 'efficient' technologies, skillfully designed to re-make nature less wastefully than in the past. The hope is that new processes and gadgetry will prevent the biosphere from being pulverised by mining or incinerated by manufacture. This utopian thinking is routine in establishment sustainability circles where consultants argue the case for 'de-materialisation'.

The dematerialisation thesis is quintessential capitalism. In fact it is symptomatic of the classic scientific substitution of mechanism for organism (Merchant, 1980). The argument that by means of sophisticated, often digitally enhanced production, it is possible to generate the same output using less material throughput, readily succumbs to the EROEI effect, for the full cost of manufacturing the new technology itself is rarely factored in. Under capitalism these material costs are often rendered invisible by externalisation on to other classes, races, genders, or species. The UNFCCC's 'carbon sink' is a related case in point, whereby the livelihood of forest dwellers is sidelined in order to maintain the urban consumerism of middle class others (Johnsson-Latham, 2006; Isla, 2009). Each of the planned green jobs mentioned by the ITUC involves matter/energy hungry technologies:

> ... targetted investments and policies aimed at creating green and decent jobs in certain sectors, such as renewable energies, energy efficiency and public transportation can help us overcome the job crisis we are living through, and unions today are willing to convey this message to the world (ITUC, 2010).

There is a pressing need for education programs to equip unions, activists, and others, with conceptual tools for thinking through all aspects of the human interface with biological processes. As the Manila based IBON group points out: the history of the humanity-nature nexus needs to be reconfigured (2010). Only the labour of people working hands-on in the landscape can begin to repair the damage done by mining, deforestation, agro-industry, urbanisation, and manufacture.

The Australian Context

Conventional programs for mitigating the collateral damage of consumer economies - melting icebergs, species loss, pollution induced cancers - simply bandaid a competitively masculinist neoliberal system tailored to production for individual gain. The Australian Labor Party's lapsed Carbon Pollution Reduction Scheme (CPRS) was symptomatic of this. It would have transferred a $13 billion compensation payment from people's pockets to polluter's pockets (Rosewarne and Goodman, 2009). That injustice aside, emissions trading makes no sense from an ecological point of view. The CPRS arbitrarily selects out the carbon variable from a complex functioning ecosystem, presumably because emissions are measurable and so may be priced. Once the object is priced, trading is inevitable. By the solipsism of economic reasoning, energy efficiency has value because it reduces the cost of carbon. Conversely, by ecological reasoning, it is the functional integrity of natural metabolic processes that has value, and emissions trading does nothing to preserve that. This is why many peasant movement activists argue for the cancellation of carbon trading and offsets.

> Carbon trading has proven extremely lucrative in terms of generating investor dividends, but has completely failed in reducing greenhouse gas. In the new invented 'carbon market' the price of carbon keeps dropping to rock bottom, which encourages further pollution. All carbon emissions should be reduced from the source, rather than allowing payment for the right to pollute (Via Campesina, 2010).

As the Rudd Labor government lost momentum on the CPRS cap and trade approach, the Australian Green Party began pushing for an interim carbon tax of $20 per ton on emissions. Meanwhile, pragmatic local environmentalists formed a Transition Decade (T10) Alliance. This

eclectic grouping joins together Friends of the Earth, the Climate Emergency Network, Sustainable Living Foundation, and Beyond Zero Emissions Network. It intends to reach into business, community, and activist circles, helping them to align their political priorities (Ewbank, 2010).

The Beyond Zero Emissions initiative is an exemplar of ecological modernisation and has much in common with Gore's 'powershift' approach. The report *Zero Carbon Australia: Stationary Energy Plan* (2010) is endorsed by the International Energy Agency (IEA); nuclear power advocates like Australia's former Chief Scientist Robin Batterham, as well as Sinclair Knight, Sandia, Lockheed Martin, Bechtel, Pacific Hydro, and Leighton Holdings. The Zero policy package was released to a socially mainstream audience at the Sydney Town Hall by ten men in suits - including Bob Carr, Malcolm Turnbull, Scott Ludlum, science and industry representatives, as well as Alan Jones, Development Officer with Sydney City Council, formerly of the Greater London Authority. Climate change was introduced as a trans-generational moral challenge; 'science' invoked freely and IPCC findings accepted as given; oil, coal, and population growth were the bads; and technology vital to tackling the climate crisis with carbon pricing a first step. Beyond Zero Emissions advocates a mix of technologies for baseload energy production in a climate-compromised world. Wind power sites already operating in Australia should be boosted and grids extended. Methane is another renewable option. But the centrepiece, a Concentrating Solar Tower (CST) emulates Spain's massive investment in solar thermal plants. As a cover blurb from Andrew Dyer, Director of BrightSource Energy, Australia reads:

> Our team at BrightSource has now completely re-engineered the whole approach to solar thermal, utilising a centralised tower to effect a direct solar to steam design. By using flat glass mirrors that track the sun all day and through the seasons, our tower plants generate steam at 550˚C and higher, allowing us to use standard Rankine cycle generation power blocks that are dry cooled. With far greater efficiencies, higher capacity factors, lower capital costs and the ability to operate the plant in hybrid mode and/or with storage, the BrightSource Luz Power Tower is the proven technology of today and well into the future for delivering firm, renewable power (Beyond Zero Emissions, 2010: 3).

A public-private joint venture company is envisaged for rolling out the model and it is estimated that 80,000 jobs would be provided during the construction phase. In addition to solar thermal energy generation, a green infrastructure plan is envisaged for urban areas consisting in innovative building design, water recycling and extraction of water from waste, automated waste collection, and led lighting in public places. A spin-off from the technology might be manufacture of an electric car for export. Australia is projected as a potential energy source for South East Asia, even 'a powerhouse' to the world. Ironically, according to the Jevons Paradox, the cheaper energy production is, the more 'stuff' will be produced. But 'stuff' cannot be manufactured without turning more of nature into waste (Leonard, 2009). The Zero plan may cut carbon emissions from energy generation facilities but it will do nothing to stop the extractive assault on the society-nature metabolism. Ecological modernisers grounded in the economic paradigm are often inclined to overlook how 'everything is connected to everything else'.

Beyond Zero Emissions claims that one square metre of solar mirror will generate the same amount of energy as 20 tons of coal, but have all solar thermal consequences been anticipated? At every plant site across Australia, engineering for the Stationary Energy Plan entails a radical transformation of the landscape by tree clearing, drainage, and levelling. An accumulation of mirrors across a large field is likely to function as massive radiant 'hot plate', impacting on the surrounding atmosphere and affecting the stability of local weather. Another environmental externality is water. An Appendix to the *Stationary Energy Plan* calculates that CST installations use less water than power generation by fossil fuels. Nevertheless, surface, ground, and even desalinated water supplies will be called for. The sites - and regions - and water bodies - potentially affected are Carnavon and the Gascoyne River; Kalgoorlie and Salt Lake; Port Augusta and the Mambray Coast; Broken Hill and the Darling River; Mildura and the Murray River; Bourke and the Barwon-Darling Rivers; Dubbo and the Macquarie-Castlereagh Rivers; Moree and the Gwydir River; Roma and the Condamine River; Charleville and the Warrego River; Longreach and Cooper Creek; Prairie, and the Flinders River. Zero researchers have done the numbers, but the difficulties Australians have had in managing the River Murray system, suggest there may be political obstacles up ahead. At this point in time, the ecological integrity of the Australian continent is critical. And as communities increasingly adopt the principle of food sovereignty,

availability of water for edible produce reaches a premium. People can't eat renewables.

Another Australian grouping, the Community Climate Network spans mainstream and Left political views. It rejects emissions trading, but calls for - legislation on a carbon tax and mandatory UNFCCC temperature stabilisation at 1.5 degrees C above pre-industrial levels. It advocates no new coal mines or coal-fired power stations; support for renewables; cradle to grave audits on manufactures; energy efficient public transport; monitoring of livestock emissions; changing land use patterns and reafforestation to improve bio-sequestration. Where jobs and communities are negatively affected by these measures, 'just transition programs' would be introduced. In addition, the CCN wants to see education for environmental literacy among public and political leaders. Population control is identified as one among many false climate solutions. Likewise, nuclear power generation is rejected for its potential imposts on human and landscape health - uranium mining in Australian indigenous environments a case in point. Links between uranium and weapons manufacture is a further possible 'collateral damage' of the nuclear power industry. Most importantly, as one member of the CCN network explains, plainly with the limits of ecological modernisation in mind, it is important to ensure that methods to reduce carbon intensity are not offset by renewed opportunities for accelerated growth:

> ... we need to direct the economy and society to regenerative sufficiency, away from the productivist exploitation of natural resources (in particular fossil fuels). New norms of development are required to shift to forms of regenerative growth, and these norms must drive and underpin any 'direct action' program ... (Goodman, 2010).

To reinforce moves towards global justice, the Community Climate Network supports the funding of adaptation measures to compensate the North's ecological debt to the global South. In line with the global Climate Justice Movement (Climate Connections, 2010), offset schemes such as REDD (Reducing Emissions from Deforestation and Degradation) are deemed ecologically, socially, and culturally destructive. The 2010 CCN Summit in Canberra chose to work with a mix of strategies, encouraging people to contribute their different skills. Some of these skills lend themselves to light green, short term, climate responses; others favour a radical critique of the economic system. One

of these was a minority opinion on the carbon tax as 'an ineffective distraction':

> A carbon tax does not address the causes of the climate crisis. Instead, like emissions trading, it assumes that it is possible to internalise climate 'externalities', to allow growth-as-usual. As such, a carbon tax privatises the right to pollute, so that those with the most economic power are able to continue polluting. While a carbon tax could potentially raise public revenue to enable investment in renewables - but as a tax on consumption, a carbon tax is socially regressive – it raises revenues disproportionately from those least able to pay. We need to campaign for real solutions – keeping coal in the ground (CCN, 2010: 6).

Strategy 2: Living Well

For several decades ecological feminist theorists and activists have been exploring the possibility of an alternative development model and a more culturally reflexive North-South dialogue (Mies, 1986; Salleh, 1997; Bennholdt-Thomsen, 2001). More recently a similar process has been activated by alternative globalisation movements through the World Social Forum (Gautney, 2010). Yet the overly ambitious WSF is foundering for want of a unified political focus. So it happens that the worldwide Climate Justice Movement offers a more practical opportunity for working towards global democracy. In response to the COP15 stalemate in Copenhagen, President Evo Morales of Bolivia called a Peoples' World Conference on Climate Change and the Rights of Mother Earth. This April 2010 meeting in Cochabamba, hosted by the country's indigenous peoples and women, was an attempt to interrogate the hegemony of capital, reframing climate politics with a 21st century social contract.

The guiding principle of the Bolivian approach is their traditional notion of Living Well (*buen vivir*), and this featured in the preamble of the People's Alternative Climate Summit.

> We are all valuable, we all have a space, duties, and responsibilities. We all need everybody else. Based on complementing each other, the common wealth, organized

> mutual support, the community ... develop[s] ... without destroying man and nature ...
>
> Within the Living Well framework, what matters the most is neither man nor money; what matters the most is life. But ... the two development models, the capitalist and the socialist need rapid economic growth ...
>
> ... development ... is now the leading cause of global crisis and the destroyer of planet Earth, because of the exaggerated industrialization of some countries' addicted consumerism and irresponsible exploitation of human and natural resources ...
>
> The new models must begin by accepting there are fundamental limits to the capacity of the Earth to sustain us. Within those limits, societies must work to set new standards of universal economic sufficiency (Morales, 2010).

The World People's Conference on Climate Change and the Rights of Mother Earth developed an impressive list of recommendations from workshops on the structural causes of climate change, historical responsibility and climate debt, mitigation, adaptation, financial provision, technology transfer, deforestation, agriculture, and capacity building. Morales presented the conclusions at a special meeting of the UN and in a subsequent diplomatic round including a visit to the Vatican. The Bolivian UN Ambassador Pablo Solon has continued this advocacy (CMPCC, 2010b), albeit with limited success. Certainly, Cochabamba was an historic postcolonial moment in drawing together an alternative North-South climate constituency. Even so, the Final Conclusions of Working Group 13: Intercultural Dialogue to Share Knowledge, Skills and Technologies (CMPCC, 2010a) point to an area of weakness in climate justice thinking as will be discussed below. Mitigation, adaptation, financing, and technology transfer are key UNFCCC topics under Long-Term Cooperative Actions. But in addressing technology, the Cochabamba workshop largely contradicted its own overarching objective of Living Well by giving legitimation to the ecological modernisation agenda.

This backward step holds important lessons for global climate activists. The capitulation sets in at section F. 'Enhanced action on technology development and transfer', where an urgent need to 'catch up' with industrialised nations is stated (CMPCC, 2010a, Clause 41).

Development and technology is assumed to be necessary to respond to climate change and both are assumed to be neutral. The statement elides direct causal links between consumer economies and climate destabilisation. The environmental, social, and culturally homogenising, effects of the affluent North's exported technology transfer are also elided. The viability of tried and tested local technologies and indigenous capacities (Salleh, 2009b), bows to the dated rhetoric of a 20th century ideal, a uniform global economy.

> Transfer of technology must fully compensate the loss of development opportunities due to the costs and technological demands to developing countries to live within a restricted atmospheric space. Poor countries face climate-related challenges to their development that were not faced by the developed countries in the process of their own development (CMPCC, 2010a, Clause 42).

The definition of 'poor countries' here is uncritically neocolonial, with development understood in an aspirational opportunity. In the ideology of ecological modernisation, the poor are characterised as unsophisticated 'victims' and patronised as unwitting contributors to the environmental crisis. In fact, per capita carbon emissions from the predominantly rural South are far lower than those of the urbanised North. But eurocentric notions of poverty and development are used in this document, as if they were unproblematic terms. The technology statement reads as if it had been written in the industrialised world, and indeed, UNFCCC texts may well have been adapted by Working Group 13 in the absence of any political vocabulary for arguing 'eco-sufficiency and *buen vivir*'.

The belief that technology is necessary for climate mitigation complements the belief that finance is necessary. However, to recap the Jevons Paradox: reliance on economic production and market instruments in order to trickle down environmental benefits, can only increase the material turnover of nature, fuel inputs, and carbon outputs. It is agreed across the board that global warming projections could be reduced immediately by 20 per cent, if land clearing ceased. In countries North and South, commercial development projects like logging, dam construction, or biofuel cropping, destroy vegetation that serves as a 'biotic pump'. Living plants function as 'heat valves', re-coupling CO2 emissions through water evaporation and restoring local temperatures by

precipitation (Hesslerova and Pokorny, 2010). Vegetation also helps renew groundwater and fosters carbon sequestration in the soil. Scientific evidence supports the argument that both subsistence farming and indigenous gathering economies in the global South are ecologically benign and climate friendly.

Section F of the Cochabamba recommendations goes on to describe the stages of economic growth as follows:

> Sharing the complete technological cycle, namely enhancement, development, demonstration, deployment, diffusion and transfer of new and existing innovative technologies is urgent and essential to strengthening developing country Parties capacities in particular those listed in Art. 4.8 of the Convention. Developing countries must be recipients of the technological cycle in its integrity (CMPCC, 2010a, Clause 43).

The phrase 'technological cycle in its integrity' is somewhat mystifying. Transferred technologies are both out of integrity with the environments in which they are manufactured and they result in a further loss of integrity in the environments they are exported to. Beyond this thermodynamic destabilisation, the transfer of mechanised and digitised technologies takes a heavy toll on the symbolic integrity of daily practices in non-industrial cultures.

This distribution of saleable products by transnational capital is assisted by bureaucratic agencies such as the World Trade Organization (WTO), Global Environment Facility (GEF) and Intergovernmental Panel on Climate Change (IPCC). The World Bank is also making a role for itself within the climate change establishment (IBON, 2008). Thus, the Cochabamba Working Group 13 concedes that

> Guidelines shall be established for the assessment and evaluation of technologies meant for transfer and deployment to ensure that they are environmentally sound and socially appropriate (CMPCC, 2010a, Clause 45).

Nevertheless, these instrumental guidelines hover above so called developing communities as abstract forms of governance. They do not engage locally with people who oversee the humanity-nature metabolism on the ground.

This said, the Intercultural Dialogue to Share Knowledge, Skills and Technologies makes an important critical assertion with:

> We recognize that indigenous and traditional knowledge and technologies form a valuable and useful part of the knowledge and technologies that are appropriate and useful for mitigation and adaptation activities in addressing climate change and that these have to be supported and be part of technology development, transfer and deployment (CMPCC, 2010a, Clause 46).

How then are local knowledges and skills to be supported by capitalist financial instruments and bureaucratic regimes, whose very penetration of daily life unravels the coherence and practice of traditional knowledges? This process is exacerbated once indigenous biodiversity expertise is classified under intellectual property law. It is noteworthy that CMPCC, 2010a, Clauses 47, 48, and 49 reject private patents and demand open access for all technologies. The object is an intellectual commons, consistent with open access to livelihood resources like land, water, and air.

Yet instead of demanding 'cross-cultural scientific dialogue' and the recognition of low carbon subsistence economies in the global South, the Cochabamba text falls in line behind the ecological modernisation model.

> We agree that early and rapid reduction of emissions requires the deployment of low-emission technologies on a massive scale and that developing countries particularly those with insufficient or no manufacturing capacity in environmentally sound technologies will have more difficulties in accessing adaptation and mitigation technologies and that measures shall be taken to facilitate and ensure their access to the technology (CMPCC, 2010a, Clause 50).

North or South, the neocolonial mindset assumes that adaptation and mitigation can only be achieved through purchase or manufacture of new technologies. Thus, Working Group 13 adopts the familiar dependency posture, rather than assuming global leadership by asserting the scientific rationality of its small ecological footprint (Salleh, 2008). The demand for 'financing from developed country Parties amounting to at least 1% of their GNP' may compensate the ecological debt incurred by eurocentric

plunder, but it effectively locks the South more deeply into the capitalist machine.

By default, the conclusions of the technology group concede to a transnational program of neoliberal 'control' - one that echoes the Multilateral Agreement on Investment (MAI) and reinforces the WTO. This global economic imperium will coordinate stakeholders at local, national, and international levels. It will create a Technology Executive Board; Technical Panels for adaptation and mitigation; Innovation Centres, and A Technology Action Plan. In addition Cochabamba proposes a Multilateral Climate Technology Fund composed of Regional Groups of Experts in Investment and Development; and a compliance mechanism to remove barriers to technology transfer, diffusion and development. While training is envisaged as top down, endogenous capacities are to be enhanced. The assessment of appropriate technologies will look at economic and social factors (as conceived by capital and its consultants) but cultural autonomy is rarely mentioned.

Post Cochabamba UNFCCC documents reveal that technology transfer is becoming a neocolonial climate forcing, enmeshed in a confusing bureaucratic architecture; a system that is both time and energy consuming and expensive for governments, NGOs, and climate activists to deal with. The original EGTT (Expert Group on Technology Transfer) is being wound up. The SBSTA (Subsidiary Body for Scientific and Technological Advice) and SBI (Subsidiary Body on Implementation) are to be complemented by a new TEC (Technology Executive Committee) and CTCN (Climate Technology Centre and Network, the latter phasing in at COP17 (TWN, 2010). The pace of this evolving multilateral bureaucracy gives the lie to the urgency of climate change. Rather, it serves the morality of ecologically modern gentlemen, aiming to

> (b) Stimulate and encourage, through collaboration with the private sector, public institutions, academia and research institutions, the development and transfer of existing and emerging environmentally sound technologies ...
>
> (c) Develop and customize analytical tools, policies and best practices for country-driven planning to support the dissemination of environmentally sound technologies ...

> (iv) Stimulating the establishment of twinning centre arrangements to promote North–South, South–South, and triangular partnerships with a view to encouraging cooperative research and development; (UNFCCC, 2010:43).

UNEP becomes central in consultations with stakeholders in the global South. The GEF continues to conduct 'needs assessment' and fund technology transfer projects in conjunction with advice from business, the EGTT, UNEP, UNDP, UNIDO, the World Bank and UNFCCC among others. The GEF will 'support technology centers and networks at global, regional, and national levels' (GEF, 2010). Inside this non-transparent frame, the Global Environment Facility promotes green capitalism with pilot projects like CO2 Capture and Storage from Sugar Fermentation in Brazil; Green Trucks in China; and Renewable Wave Energy in Jamaica.

Beyond 'North/South', 'Left/Right'

Against the neocolonial tenor of its technology conclusions, the main body of the Cochabamba Declaration reaffirms the need

> ... to recognise the plurality of forms of knowledge and ancestral practices, and transform scientific practices based on control over nature toward paradigms oriented toward equilibrium with nature (CCPM, 2010a)

But scarcely a trace of the Cochabamba goal of Living Well or its technology proposals is carried forward in the UNFCCC negotiating text for the December 2010 COP16 in Cancun. The transnational climate establishment and the grassroots climate justice movement continue along parallel political paths. However, this sociological hiatus hands the people's movement an opportunity to examine the contradictory nature of its thinking on technology transfer and finance for development. The government of Bolivia remains conflicted and ambivalent over economic development. It stands firm on food sovereignty and indigenous knowledges. It argues that technology transfer should be part of a climate debt owed by the North, free from conditionalities and Intellectual Property Right (IPR) restrictions. But the Cochabamba Declaration has two faces - and its second face is an ecologically modernising model, open for exploitation by business-as-usual.

Peoples of the global South could be saying 'no thanks!' and assuming international leadership here. Since the eco-sufficient know-how of meta-industrial workers like peasant farmers and indigenous gatherers has much to teach old industrialised communities and rust belts trying to establish Transition Towns. Would be eco-socialists might take note of this new class agency as well. A development paradigm that functions in equilibrium with nature is also emerging from post-communist Europe. At COP15, the People and Water NGO presented an integrative ecological strategy for climate stabilisation.

> The living world influences the climate mainly by regulating the water cycle and the huge energy flows which are closely linked with it. Natural ecosystems also develop in the long term towards the stabilization of closed cyclical processes (e.g. the water or carbon cycles), whose central medium is water and which efficiently manage solar energy with minimum material losses. Transpiring plants, especially forest growth, demonstrate especially efficient water management. They work as a kind of biotic pump, causing humid air to be sucked up out of the ocean and transferred to dry land (People and Water NGO, 2009: 1).

The uncoupling of water and carbon cycles which destabilises climate is a product of development: deforestation, industrial agriculture, urbanisation, and manufacture. Cleared land and paved cities draining water to the sea, lead to a form of landscape entropy (Ripl, 2010). As underground aquifers dry out, the hydrological cycle is disturbed, soils cannot support plants or sequester carbon, which is then given up to the atmosphere as CO2 (Norris and Andrews, 2010). Drying, devegetated land directly affects local weather because evaporative cooling of the air, cloud formation, and rainfall are disturbed. Forests are much more than mere 'carbon sinks', and as climate expert Richard Betts of the UK Meteorological Office points out: 'the role of tropical forests in protecting us against climate change is severely under-rated' (Pearce, 2009). The Kosice Protocol, as argued by the People and Water NGO is scientifically verified, but holistic rather than reductionist. It stems the metabolic rift of urbanisation and agroindustry through human reciprocity with organic processes rather than control over them.

In the villages of Slovakia, the People and Water NGO is encouraging communities to protect both their water catchments and cultural identity in the land. For the fact is that societies across the globe are unevenly

inter-linked with the capitalist economy, and many strive to remain free of it altogether. People who do, such as many Indonesian peasants or Peruvian forest dwellers, understand what a green job really means. A green job is one that regenerates ecosystems and human bodies through the creation of 'metabolic value' (Salleh, 2010). This reproductive form of economic provisioning points to the possibility of a climate friendly alternative development model for the 21st century. In the words of one international peasant movement:

> Sustainable local food production uses less energy, eliminates dependence on imported animal feedstuffs and retains carbon in the soil while increasing biodiversity. Native seeds are more adaptable to the changes in climate which are already affecting us. Family farming does not only contribute positively to the carbon balance of the planet, it also gives employment to 2.8 billion people.
>
> [Conversely]... false solutions proposed in the climate talks, such as the REDD initiative (Reducing Emissions from Deforestation and Degradation), the carbon offsetting mechanisms and geo-engineering projects are as threatening as the droughts, tornadoes and new climate patterns themselves. Other proposals such as the biochar initiative, no till agriculture and climate resistant GMOs are the proposals of agribusinesses ... It is unfair to use the benefits that small farmers provide to the environment as an excuse to keep polluting as usual (Via Campesina, 2009).

The eco-sufficiency of Living Well is a serious contender for the socio-ecological conversion of industrialised economies, but it means capacity building in a reverse direction; with peoples of the North listening respectfully to peoples of the South, for a change. The Civil Society Declaration on Technology and Precaution released in the lead up to COP15 reflects this positioning. Deferring to the Cartagena principle, the Declaration outlined many shortcomings of ecological modernising technologies - and spoke boldly where Cochabamba Working Group 13 lacked confidence.

> In many cases, action to address climate change is within our reach already and does not involve complex new technologies but rather conscious decisions and public policies to reduce our ecological footprint. For example, many indigenous peoples and peasants have sound endogenous technologies that already help

> them cope with the impacts of climate change, and to overlook these existing practices in favour of new, proprietary technologies from elsewhere is senseless (ETC, 2009).

A long list of global climate activists signed on to this view, including, Science for People; the African Biodiversity Network; Asian Women's Indigenous Network; Amigos de la Tierra, Costa Rica; Gender CC-Women for Climate Justice; Mangrove Action; Pesticide Action Network, Malaysia; National Framers Union of Canada; Stop GE Trees, US; and the Third World Network, among others. From India, a National Forum of Forest Peoples and Forest Workers explains:

> There is a climate crisis around and no amount of free trade, capital or technology will eliminate the roots of this crisis. You forget that the crisis has emanated from the way your society is structured - an edifice based on an unending desire for resources and a way of life that sees nature as an object of exploitation and extraction (Rising Tide, 2010).

In order to roll back the current ecological and financial crises, new historical agents such as these groupings must be heard at international negotiations.

> Any new body dealing with technology assessment and transfer must have equitable gender and regional representation, in addition to facilitating the full consultation and participation of peasants, indigenous peoples and potentially affected local communities (ETC, 2009).

The deeply eurocentric and gendered focus on engineering infrastructure and the obsession with economic growth invert the thermodynamic order of nature, emptying out its metabolic value. In the language of ecological modernisation, 'biogrowth' means the exact opposite of organic flourishing; instead, it refers to the amount of biomass taken up by the machine. In this mainstream economic reasoning, productive efficiency is a formula by which dead matter (extracted from life giving biological relations) is transformed by dead labour (alienated or technologised) and distributed for consumption as dead product. By contrast, the reproductive economy, catalyses vital matter/energy exchanges, a humanity-nature nexus in reciprocity.

Against the ongoing dismemberment and commodification of nature, an alternative model of development could be premised on the common

sovereignty of energy, land, water, and air. Templates for this already exist in many low carbon economies of the global South, and indeed,

> Stopping extraction helps maintain ... low carbon cultures by producing healthy ecosystems that provide communities with food, water, medicine and shelter (Rising Tide, 2010).

The global Climate Justice Movement supports leaving fossil fuels in the earth; community control over production; reducing the North's over-consumption; localising food; holding up indigenous' rights; and reparation for ecological and climate debts to the South (People's Protocol on Climate Change, 2008; Bond, 2009). Decolonising initiatives like these provide reality testing for political actors in a global North. And it is not only neoliberal ecological modernisers who objectify nature as a resource; instrumental rationality mars some eco-socialist traditions too. To recognise the logic of low carbon societies is to show respect for the worldwide majority of non-urban meta-industrial workers, and this also makes good sense for creating alliances across movements and continents. At this conjuncture, the Left has to give up trying to turn grassroots activists into clones of Marx's industrial proletariat. The era of factory socialism is exhausted; its traditional labour force is in disarray; and historical agency cannot emerge from people disoriented by offshore relocation of their jobs or deskilled by technological change. Walden Bello (2004) writes that ultimately, a big picture climate strategy will replace global free trade with government regulation in support of local economic sufficiency. Bello calls this de-globalisation and it follows the principle of subsidiarity. Today, union workers have no choice but to grow a wider labour identity, joining with women's, peasant, indigenous, and ecological movements. This is not to give up the struggle with capital but to intensify it synergistically.

Ecological modernisation policies impose ecological, social, and embodied debts at the periphery of capital, but externalisation is incompatible with Living Well. Where IMF funded projects, WTO mandated free trade, or neocolonial UNFCCC governance structures disturb an established society-nature nexus, three things happen. First, people's livelihood resources are reassigned across to business; second, their locally appropriate knowledge skills are diminished (TWN, 2009); and third, cultural and personal identities are crushed. On the other hand, in Africa and Oceania wherever women are known to feed communities by means of low impact subsistence farming, people are buffered from

economic precarity - an insight that surfaced during the global financial meltdown. Development as understood by multilateral agencies is quantitative, whereas livelihood as understood by the commoner is qualitative - grounded in a materially functional relation with nature. A dollar a day, thus has a different meaning for a Bangla Deshi farmer with access to land, than it has for a bag lady sheltering in the New York subway. Too many well-meaning professionals and activists miss this profound difference, distracted by the ideology of ecological modernisation no less.

In Australia, responses to the climate crisis are usually classified as Left or Right (Baer and Burgmann, 2010), but the present argument points to acceptance or rejection of ecological modernisation as the defining dimension. Thus the current conjuncture shows the Federal Labor government in a climate policy vacuum, with the occasional nod towards a future carbon tax. The Liberal-National opposition variously nominates nuclear power, geo-engineering and solar thermal, carbon sequestration offsets for farmers, and even a green youth army for the unemployed. The Greens, environment consultants, NGOs like ACF, ACTU, Beyond Zero Emissions, and neighbourhood groups, embrace a miscellany of market and technological strategies. Organisations such as Rising Tide, Socialist Alliance, and Friends of the Earth, combine sustainability with global justice, and acknowledge the rationality of Living Well. The 'politico-economic divide' between Left and Right is widely understood, , but the relevant 'ecological divide' is weakly articulated in the public domain. This indeterminacy can be an advantage to a maturing climate movement, which should not be tied down by political categories formed in an earlier era. There are people across both 'North and South', 'Left and Right', who know what it takes to regenerate living systems and they can work together for climate stability. By facing up to the internal contradictions of ecological modernisation they will gain cultural reflexivity. Hopefully, they will then use that self-awareness to validate the leadership of communities in the global South who have pioneered low carbon, nature attuned, eco-sufficient economies. It is time for climate activists to make a clear choice between the strategy of ecological modernisation and the strategy of Living Well - support for the latter will shift several historical processes forward.

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