



**What Do We Owe to Those Not Yet Born?
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We all know the story of Easter Island – the collapse of a once flourishing civilisation as the last tree was cut down.

To Jared Diamond in his book *Collapse*, it was a case of ‘econocide’.

The demonstrators of Extinction Rebellion fear that if we do not change our behaviour radically and soon, we are heading in the same direction as a result of climate change.

It is difficult to imagine what was going on in the minds of the final generation on Easter Island as they cut down the last tree with a loss of fuel or building materials. Why did they not stop sooner?

How did they debate their plight and what steps did they take?

Tragedy of The Commons

It is an example of what Garrett Hardin (1968) called ‘the tragedy of the commons’: the situation where a common resource (forest, fisheries, grazing land) belongs to no one individual.

‘Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all’.

Each forester, fisherman or farmer has an individual interest to maximise the number of trees, fish or sheep on the common pool resource; if any individual stopped, they might fear that others would not and would exploit the situation; so everyone continues their individual behaviour to the ultimate harm of everyone when there were no trees, no fish, and no grass.

‘Throughout history, human exploitation of the earth has produced this progression: colonize-destroy-move on’.

It might work for one or two generations – but ultimately a future generation would suffer.

His concern was population growth rather than climate change. He thought that population continued to grow because the welfare state meant that the imprudent did not die out. People must therefore surrender freedom to breed.

“if each human family were dependent only on its own resources; if the children of improvident parents starved to death; if, thus, overbreeding brought its own "punishment" to the germ line--then there would be no public interest in controlling the breeding of families. But our society is deeply committed to the welfare state, and hence is confronted with another aspect of the tragedy of the commons.”

It was a combination of Malthusianism and eugenics.



The risk that population growth would exceed the carrying capacity of the planet was common in the 1960s and 1970s, such as the Club of Rome report on *Limits to Growth*, 1972 which used computer simulation to argue that ‘the behavior mode of the system ... is clearly that of overshoot and collapse’. The answer was a ‘state of global equilibrium’ by a deliberate and controlled reduction of population and capital, with limits on individual freedom to have children and consume resources. By concentrating on activities that did not consume large amounts of resources – education, art, music – limits on growth could still lead to human improvement. ‘Without such a goal and a commitment to it, short-term concerns will generate the exponential growth that drives the world system towards the limits of the earth and ultimate collapse’.

Such thinking also informed the one child policy of China.

Now, the debate is over climate change rather than population. Eugenics is now beyond the pale – and the social consequences of China’s one child policy are apparent (actions have long-run impact on future generations, with problems of care of elderly parents; reduction in active work force in next generation).

These debates did lead to an interest in the ways in which common pool resources can be preserved for future generations, how over-exploitation can be prevented and ‘econocide’ avoided. The thinking helps inform our approach to climate change.

Historically, there were three approaches:

Property rights: if common land and forest were allocated to an individual, it would be possible to protect it from over-exploitation by others. This happened in, for example, the enclosure movement in England when common fields were separated into individual plots. It is less easily done for fishing in oceans, or for pollution of the atmosphere in the industrial revolution.

State action – against smoke pollution or polluting rivers, government regulation to ban emissions. This worked at the local or national level to stop pollution of a river or smog in London or Los Angeles; it did not deal with spill overs across national boundaries.

Institutions to manage resources. Elinor Ostrom, *Governing the Commons* (1990) studied actual communities and how they managed their resources so they were not over-used. By considering contemporary fisherman in Maine or forests in Nepal – she found diverse institutions that could manage common pool resources. The tragedy of the commons could be avoided.

Success depends on a number of factors which she set out in her book and subsequent articles:

- Clearly defined contents and effective exclusion of external non-entitled parties;
- The size of resource system: a moderate territory is most conducive to self-organization;
- Resource unit mobility – self-organization becomes more difficult with mobile rather than stationary units, for example in a river versus a lake;
- The number of users – transaction costs can be higher with larger groups, but such groups can also mobilize more resources;
- The productivity of system: self-organization is less likely to work if a resource is either over abundant or already exhausted;
- shared moral and ethical standards, trust and reciprocity;
- Collective-choice arrangements that allow most users of resource to participate in the decision-making process;
- Effective monitoring by agents who are part of or accountable to the appropriators;
- A scale of graduated sanctions for resource appropriators who violate community rules;
- Mechanisms of conflict resolution that are cheap and of easy access



A moment's reflection suggests these rules are difficult to apply to global issues of climate change: The first option is problematic: can property rights in the atmosphere and the future of the planet be established? Not really.

State action can control carbon emissions in one country, but in most cases a small part of the total global emission. Other countries can free ride.

Institutions are difficult to create for they need to be global – they cannot apply to the fields or forests of just one village or community.

- excludability from the planet is not an option!
- group is the entire population of the world (or at least all governments);
- the atmosphere is even more difficult to control than a lake;
- we cannot assume common values, or trust and reciprocity;
- monitoring, enforcement and sanctions are difficult.

At the end of her life, Elinor Ostrom puzzled over how to scale these issues up to the global level – and I will come back to her thoughts at the end of the lecture.

The political difficulties are particularly powerful in the case of climate change – they raise intergenerational concerns in a stark way. Fish stocks, forests and grazing land can, with appropriate action, regenerate within a generation; carbon in the environment is there for much longer, and our action now can affect future generations not yet born and who might not be born.

My aim in this lecture is not to venture into the science of climate change. Rather, it is to consider the policy responses that are being adopted to deal with the 'tragedy of the commons': who should act, at what cost, and how, to deal with the spill-overs across national boundaries; free riders who continue with carbon emissions as others act; and the extent to which we should control our behaviour for the benefit of the future.

I start by considering the apparently technical and geeky topic of social discount rates. Extinction Rebellion demonstrators chant 'Change the Discount Rate'. But as I explained in the first of these lectures when I considered QALYS, policy is very often driven by measures devised by economists that are not often publicly debated and are embedded deep in government departments. Let's probe at the social discount rate which affects how much is spent on climate change mitigation.

Social Discount Rates

When I gave the first lecture, a comment was posted congratulating Gresham College for 'introducing yet another Marxist adjective to undo the stand-alone noun justice – intergenerational'. The term has nothing to do with Marxism – and was not invented by Gresham college. It has been a standard theme in philosophy and economics for well over a century and was a central strand in Cambridge economics and philosophy from the late nineteenth century.

In 1920, Pigou remarked that,

“Our telescopic faculty is defective.... We see future pleasures, as it were, on a diminished scale... This reveals far-reaching economic disharmony. For it implies that people distribute their resources between the present, the near future and the remote future on the basis of a wholly irrational preference.”

As a result, 'efforts directed towards the remote future are starved relatively to those directed towards the near future'. It was not so much that this decision was immoral as mistaken – we might consume now rather than saving for the future.



It also followed to these writers that individuals and families could not be left to look after the remote future: as Pigou said, in 1924 'The state should protect the interests of the future in some degree against ... our preference for ourselves over our descendants'.

This line was taken up by Frank Ramsey, a Cambridge mathematician, economist and philosopher (and a fellow of King's College with Pigou). He died in 1930 shortly before his 27th birthday, probably from Weil's disease from swimming in the Cam. He was a colleague of Keynes and Wittgenstein and in many people's eyes a greater economist or philosopher than either.

His article of 1928 still provides a foundation stone. He asked the deceptively simple question: how much of its income shall a nation save?' This is an intergenerational or intemporal issue: if we consume a lot now we are not setting aside savings for investment that will benefit the future; if we save too much, we hold down our current enjoyment and might be producing excess savings which will not find profitable outlets. The question is where to draw the line?

Ramsey commented that 'it is assumed we do not discount later enjoyments in comparison with earlier ones, a practice which is ethically indefensible and arises merely from the weakness of the imagination'.

He went beyond Pigou: neglecting the remote future was not only mistaken by immoral or unethical. To the Cambridge school, then, inter-generational choice was ethical: future people should count for the same as present people.

You might think this is self-evident – but in fact it was rejected by most economists who 'discount' later enjoyments.

Suppose I offer you a cake now or two cakes in a year: most people would take the immediate satisfaction of the cake now – they might be dead in a year, or their income might be larger so that the extra cake was worth less in real terms. We discount the future benefit – or in the case of the environment and climate the future damage.

Why?

- time preference: to delay consumption and immediate satisfaction, we will need the payment of interest; or we can see if you prefer my offer of a cake today or two cakes in a year. This is descriptive of observed behaviour.
- Changes in consumption behaviour as income changes: as our income rises in the future, we might not spend such a large proportion to secure the same level of satisfaction
- The future will be richer than us, so that in the same way that we impose a higher tax on the rich than on the poor at a given point in time, so we should leave the future to bear costs rather than pay now.

We can work out how much any benefit or damage is worth in 10, 50, 100 years in the future. This intergenerational calculation is not Marxist: it is used by the Treasury to decide whether to build a railway here or a road there. The Treasury applies a discount rate of 3.5 per cent: if the project delivers a higher return, it is worth proceeding – and obviously, a project with a greater return will have preference.

You are probably wondering what this has to do with climate change – to which the answer is 'a lot'. The discount rate is the subject of heated debate and has a major impact on policy. The key players are Nicholas Stern – the adviser to the British government – and William Nordhaus, an American Nobel prize winner in economics.



Nicholas Stern

- Discount rate: 1.4 per cent. Low because he gives a time preference of 0.1 per cent to allow for extinction from a meteor strike etc. Prescriptive rather than descriptive.
- Hence \$1 trillion of damage caused in 100 years is valued at \$247 billion
- Action needs to be immediate and drastic: investment will be worthwhile.
- Spend 1 per cent of total production to reduce greenhouse gases

He adopts the Pigou and Ramsey line:

- 'if you care little about future generations you will care little about climate change.... That is not a position which has much foundation in ethics and which many would find unacceptable' [54]
- 'If little or no value were placed on prospects for the long-run future, then climate change would be seen as much less of a problem. If, however, one thinks about the ethics in terms of most standard ethical frameworks, there is every reason to take these prospects very seriously.'

William Nordhaus

He is not a climate change denier; and he does point out in his 2013 book that 'there is a tendency for the current generation to ride free by pushing the costs of dealing with climate change onto future generations. Generational free riding occurs because most of the benefits of emissions reductions today would accrue many decades into the future'.

The disagreement with Stern is over the extent to which we should stop free riding by the present on the future.

- Discount rate: varies in his work: 6, 5.5, 4.3 per cent - descriptive
- At 6 per cent, \$1 trillion of damage caused in 100 years is valued at \$2.5 billion
- Hardly enough to justify the costs of reducing greenhouse gases now – better to spend the money on other things
- Recommends spending c 0.1 per cent of total production or \$9 per capita
- Action should be slow and modest – the costs are too high relative to benefits

We need to use a discount rate that reflects the actual market opportunities that societies face, not an abstract definition of equity taken out of the context of market realities. The logic of market discounting is not just a selfish view that the future should take care of itself. It does not hold that we should consume all our income and make no investments to protect our world or future generations.... The discount rate should be set so that our investible funds are devoted to the most productive uses. A portfolio of efficient investments would definitely include ones to slow global warming. But is also includes investments in other priority areas – health systems at home, cures for tropical diseases, education around the world, and basic research on all kinds of new technologies" [193]

That is fair up to a point – but is it either/or? What if we raised taxes to do both (including tax on carbon emissions)?

This technical dispute matters

- Governments use the method to set a carbon price which determines whether fossil fuels or renewables are cheaper;
- The discount rate determines how urgent action is compared with alternative spending;
- Social and ethical assumptions and political choices are hidden in seemingly technical and objective measures: we need to understand their limits and assumptions in the models



My own view is that Stern's approach – following Ramsey - is correct. We should apply temporal impartiality. Why?

- Time discounting is applicable to building a railway: sensible to ask if it is better than another option; if an error is made – HS2 or a third runway at Heathrow – we can write it off without an existential threat. This does not apply to climate change which has long term and severe effects: we cannot opt for another planet. Rather than a descriptive approach, it makes more sense to be prescriptive – just because we observe people acting in a certain way – wanting their cake now rather than later - does not mean it is ethically correct.
- Our individual revealed time preference in choosing to save or consume as self-interested individuals is not the same as how we might feel about future generations: we might adopt a normative/prescriptive or altruistic attitude.
- Future generations are not present to have voice about their interests – they should have the same ethical value. Some economists say that those not present cannot have any political rights, but why should we deny rights to people distant from us in time and not in space?
- Will the future be richer? The claim rests on continued growth which might be prevented by the actions of the present generation;
- growth in global output is seen as necessary for providing the funds needed for reducing our ecological footprint, even though growth in global output is known to increase that footprint.
- Minimises the impact of climate change on growth – in a paper of 2017, Nordhaus assumes a 3C increase in temperature reduced incomes by only 2 per cent, and 6C by 8 per cent. Really? As one critics pointed out, the model is symmetrical so a fall in temperature would have the same effect in the last ice age.
- and it might be that future generations have different assumptions about growth.
- The future has a right to enjoy a world whose climate or environment has not been harmed
- ecological and biodiversity loss: what counts is not only what can be counted in GDP – the point of Partha Dasgupta's recent report.

Sir Partha Dasguta was, until his retirement, the Frank Ramsey Professor of Economics at Cambridge. He argues that

- nations need to adopt a system of economic accounts that records an inclusive measure of their wealth.
- wealth includes Nature as an asset. Using Gross Domestic Product (GDP) to judge economic performance is based on a 'faulty application of economics'.
- GDP is a flow of market dollars of output per year), in contrast to inclusive wealth, which is a stock (it is the social worth of the economy's entire portfolio of assets).
- GDP does not include the depreciation of assets, for example the degradation of the natural environment - 'G' stands for gross output, not output net of depreciation of assets.
- 'An economy could record a high rate of growth of GDP by depreciating its assets, but one would not know that from national statistics.... in recent decades eroding natural capital has been precisely the means the world economy has deployed for enjoying what is routinely celebrated as 'economic growth'. The founding father of economics asked after The Wealth of Nations, not the GDP of nations.'

So, the loss of natural capital might erode much of the gain from more productive capital.

As he puts it, we need to change our assumptions: 'The economy is embedded in the biosphere and is not external to it'.

My message so far is this: don't be fooled by technical economics and highly mathematical models; always ask what are the assumptions on which the argument rests. Economics is not physics: it is ideology.



If we agree that immediate action is needed on a large scale, what policies could we use?

Adaptation: on this view, we could live with the changes. Doubtful

- Geo-engineering: intervene to reverse the impact of carbon; or sequestration/carbon capture. This approach is advocating untested and costly solutions which might have harmful unintended consequences rather than available, feasible solutions.
- Personal behaviour: this can be used as a tactic to deflect, to accuse people of hypocrisy (why does Bill Gates use a private jet; why do you fly on holiday or eat meat?) Of course, changes in life-style are desirable but calling for voluntary action can undermine support for systemic solutions that will harm big polluters. Virtue signalling and behaviour shaming can deflect from more significant change.
- Supply side: ban pipelines, fracking. In UK, ban on petrol cars or gas/oil boilers in new houses. A regulatory response.
- BUT having criticised economists, I would also wish to defend some solutions from the gibe that they are 'neoliberal'. Demand side action through pricing carbon.

Should We Use Price Signals?

The word Marxist is used to criticise an approach that has nothing to do with Marxism; equally, the term 'neoliberal' is used as a catch-all term on the progressive left to reject ideas that might be entirely sensible. This is what has happened to the idea of a carbon tax or cap and trade.

In 2013, Nordhaus argued for both a carbon tax and 'cap and trade' schemes.

His central point is that we need to raise the price of carbon; at present, emitters are dumping carbon into the atmosphere free of charge and we need a level playing field with zero carbon users. 'The most effective incentive is a high price for carbon' [6].

- Carbon tax: firms and households pay a tax on carbon emissions, much as now do when buy petrol
- Cap and trade: country caps its carbon emissions, and then issues permits to emit a certain amount; a firm that reduces its emissions and can sell its permits to the highest bidder; this will lead to the most efficient outcomes. Used in US in 1990 for sulphur emissions; adopted in Kyoto protocol and EU Emissions Trading Scheme (which UK left because of Brexit). This can create a profitable new financial market in the City of London.

The attraction of the carbon tax is that revenue goes to the government and not just (as in cap and trade) between firms; and the carbon price is constant rather than varying as permits are bought and sold – it provides a more consistent price signal.

On the other hand, a tax does not set a definite quantity of carbon emission; and might be cut under political pressure – Nordhaus thought environmental rules setting limits might be more durable, though he claimed that before the experience of Trump removing rules.

Nordhaus thinks either scheme is better than any other approach. Price for carbon is, he argues, a signal to consumers of what goods and services are carbon intensive; to producers to move to low carbon technologies; to inventors and investors. Argues against setting hard targets as in the Paris climate change agreement – he prefers cost-benefit analysis (as we saw earlier, that could give a low value to future damage). He proposes a tax of \$25 a ton which – given his stance on social discount rates – is lower than many others propose.

Nordhaus's case for a carbon tax:

- Closest thing to an ideal tax that can be imagined
- Reduces an undesirable activity



BUT further justifications suggest why progressive critics are uneasy:

- The tax can replace inefficient regulatory initiatives
- Revenue used to reduce fiscal deficits, reduce taxes: ideal policy for a true conservative, preserve planet with economic incentives and minimal government intervention. 'We can effectively slow global warming in a conservative's way' [315]

He thought it would please fiscal conservatives as well as environmental activists [232]. The idea of carbon pricing had the support of all Republican former chairs of president's Council of Economic Advisers; and Senator Jeff Flake supported it as a way of cutting other taxes. In fact, it split the right: opposed by Koch brothers, fossil interests could see an attack on them. Similarly, environmentalists and progressives were divided. Some saw fiscal conservatism, criticised the carbon tax as regressive [heating and transport is a higher proportion of the income of poorer families] – and support by Flake is scarcely a good sign! Contrary to Nordhaus, carbon pricing could bring together voices on the right and left both in support and opposition.

A carbon tax has been adopted in some countries - Canada has a carbon tax on fossil fuels of \$15 rising to \$38 by 2022.

In the US presidential primaries Kamala Harris and Joe Biden backed a tax; Elizabeth Warren was open to it. It was rejected by Bernie Sanders and carbon pricing is not part of the Green New Deal.

When over 600 environmental organisations wrote to Congress in 2019 supporting the Green New Deal, they said they 'will vigorously oppose any legislation that ... promotes corporate schemes that place profits over community burdens and benefits, including market-based mechanisms ... such as carbon and emissions trading and offsets'.

Similarly in Australia – the Labor government adopted a carbon trading scheme in 2011, to come into effect in 2012. It was attacked by Murdoch press, portrayed as a burden on business and households. It was then lost when Tony Abbot won the election and it was repealed in 2014 – and Greens voted against it. Most climate groups opposed cap and trade for inadequate targets, creation of property rights to pollute. The director of the ANU's Climate Change Institute urged that to get emissions down, it was necessary to get away from neoliberal economics.

The opponents favour action on supply side rather than demand – fossil fuel divestment, opposition to pipelines and fracking.

I argue that rejecting carbon pricing as part of neoliberal economics is counter-productive. It is not neo-liberal to impose a fair payment for dumping of harmful carbon in the atmosphere; there has long been charges for 'externalities' – for costs that are passed on to other members of society and not internalised into the costs of companies.

There is no reason why carbon pricing and taxing should be conservative: it can be progressive:

- set the price higher than Nordhaus;
- make it progressive so rises with amount emitted and use revenues to compensate the losers - the more wealthy a household or country, the more it pays; and can transfer to poorer households and countries;
- Not use it to cut other taxes but use it to invest, stimulate green growth.

The politics are important. Macron did not adopt a progressive approach – he linked his case for green transition to other policies that of labour market reform, changes to taxes that redistributed wealth upwards, removal of benefits from the poor, and promotion of corporate-led Europe. The result was to associate carbon pricing with these policies – in rejecting austerity, demonstrators potentially ended up resisting climate policy.



Extinction Rebellion in London and gilets jaunes in Paris overlapped in some respects – an attack on austerity, inequality - but differed in others. The solution is a carbon tax that redistributes wealth downwards, and uses the revenue to create a more inclusive society.

A carbon tax can be radical. Piketty argued for a progressive carbon tax

- an exemption for households emitting less than the global average,
- increasing to \$100 a ton above the average,
- \$500 above 2.3 times,
- and \$1000 above 9.1 times the global average.

And the case does not come only from left-wing French economists: the IMF Fiscal Monitor made a similar suggestion in 2019: a global carbon tax rising to \$75 per ton of carbon dioxide by 2030, to be distributed to poorer household and communities, to reduce other taxes, and to invest in new jobs in renewable energy.

I agree with Nordhaus that either carbon taxes or cap and trade make sense - better to work on both demand and supply.

But I think a carbon tax would be better – it has a wider coverage; it can be used to compensate losers. The issue is political acceptability: a study in 2014 **SLIDE 22** found that average household emission in US households was 34 tons; willingness to pay dropped off quickly between \$80 and \$200 per household, so feasible tax in the range of \$2 to \$8 which is not enough.

Creating support for carbon tax at a meaningful level will not be easy – but attitudes can change.

Now we come back to our collective action problem form which we started. As a political scientist put it – here we have ‘the mother of all collective action challenges’. There are strong incentives to free ride on the global commons – some countries impose the tax, incur mitigation costs which others avoid. Without confidence that everyone else will take part, why incur any mitigation costs? Should – can – there be international agreements? Nordhaus says yes: the risk otherwise is that one county can free ride on another, emit more carbon and sell goods to a country that has reduced emissions. When we considered the logic of collective action, we saw that it would be more difficult for climate change than, say, tariffs on goods. Securing international agreement has not been easy – and existing multilateral organisations such as the WTO have weakened. What can we do? This is a question that Elinor Ostrom considered.

The Global Commons: At What Level Should Be Act?

There is a presumption that a collective action problems with global effects must be solved globally, with externally imposed regulations at a global level.

There have been attempts at global action.

The Kyoto Protocol of 1997 envisioned an international cap and trade system – rich countries had binding limits, other would just report. It did not happen: it was not submitted for ratification in US; though it passed the House in 2009, it failed in the Senate. And if had been adopted, how many countries had the capacity to operate it; and what would be the enforcement mechanisms?

One programme that is in use is international agreement on Reducing Emissions from Deforestation and Forest Degradation (REDD+) that was completed at UN Climate Change Conference (COP21) in 2015.



Deforestation is a significant contributor to carbon emissions, and forests are a major 'sink' for carbon.

On the initiative of the Coalition for Rainforest Nations, discussions started in 2005 as part of the UN Framework Convention on Climate Change. REDD+ established guidelines for a 'reference level' of emissions with monitoring of subsequent change and the creation of national management strategies.

It is linked to the Paris climate change agreement - a statement of good intent to limit global warming to 2C with many countries committing to 'nationally determined contributions' to cut emissions and to reach net zero by 2050.

Countries can potentially meet their national targets by offsets through REDD+, and airlines can do the same through the International Civil Aviation Organisation, though much of the funding comes from development aid.

The programme has shortcomings.

- Setting the reference level and measuring change are difficult and open to abuse to secure payments which can be exploited by unscrupulous businesses.
- Safeguarding of indigenous communities is problematic, and there is a lack of clarity on how benefits are distributed.
- 'Leakage' is another problem, for activity might be displaced to areas that are not covered, both within and between countries, or be substituting timber with concrete or oil for building and heating.
- The global approach of REDD+, and its modest funds, have little effect on the local decisions that are a matter of land tenure and the balance of political power in favour of deforestation, and local initiatives sensitive to contexts and preferable to overly complicated top-down action.

Discussions at COP, the commitments at Paris, and REDD+ have helped change international conversations – but the solution is to build up local or national programmes - which takes me back to Ostrom.

International involvement should focus on ensuring that national policies do not harm others and permitting action against free riders. Suppose the EU imposes a carbon tax or cap and trade, or there is a global target for reducing emission as in the Paris agreement. What to do if the EU reduces its emissions by purchasing imports from a country that is still polluting; and more able to compete because it has not imposed a carbon tax?

One response would be to impose a border tax adjustment on the carbon content of goods: if China did not comply with an internationally agreed carbon price, then impose it at the border.

Problems:

- Difficult to establish the content
- it only applies to what is entering international trade, and not domestic consumption of goods that emit carbon (though can force general change – all VW cars need to meet Californian standards).
- Can be used for protective purposes

A global solution will not be easy – but could be monitored by the WTO. It now considers environmental issues. In 2021, the new director general of the WTO, Ngozi Okonjo-Iweala called for a resolution of existing issues such as intellectual property, but also finding a new agenda in response to the related threats of climate change and pandemics.



What is not helpful is top-down imposition. The immediate result of the IMF Fiscal Monitor's call for a carbon tax of \$75 a ton by 2030 was outrage from the Australian Prime Minister, Scott Morrison against an unaccountable internationalist bureaucracy' that 'seeks to elevate global institutions above the authority of nation states to direct national policies'. In his view, 'only a national government, especially one accountable through the ballot box and the rule of law can define its national interests'.

A carbon tax imposed by the IMF is not feasible because of internal divisions and will merely provoke hostility. What is needed is local action to defeat Morrison and secure a local carbon tax, not top-down intervention from the IMF that is a distraction and provocation.

Indeed, there are alternative views within Australia.

- Morrison supports coal exports to China, despite the impact of climate change and the destruction of the Great Barrier Reef by new shipping facilities.
- South Australia already has almost 100 per cent renewable energy.
- The premier of New South Wales has a different approach: to become a 'renewable superpower' with some of the cheapest prices in the OECD, using pumped hydro in place of coal for the base load.

This brings us to Ostrom: she argued that – to use the common phrase – we should think globally and act locally. The approach should be 'polycentric' rather than top down. How does this work?

As she points out, it is the largest collective action problem ever: all benefit from action to reduce emissions, whether or not they have contributed to the costs – there is a huge incentive to be a free rider. And there is a disinclination to comply for we cannot trust that others on the other side of the world are doing the same – as she says, people do not want to be taken as 'suckers' in taking costly actions when others did not.

- Single government units at a global level are too complex, with too many actors and interests – finding solution will take too long.
- Global solutions – like REDD + - do not work well if not backed by national action, creation of local institutions of collective action. Although emissions are uniformly distributed in the global atmosphere, different regions have different impacts
- Although the impact is global, actions generating emissions occur at all levels - actions by households, businesses
- Action should therefore be as close to events and actors involved as possible, by creating cooperation at diverse levels. She argues that cooperative action is possible where there is agreement on the need for change, and individuals see themselves as jointly sharing responsibility. The task is to create trust so that people are willing to accept their own short-term costs because of long-term benefits, and that they see others complying. Mutual trust is difficult at the global level but can be possible at the local level.

I agree – but she is concerned with building up mutual trust that supports action, and does not mention carbon taxes that provide a price signal to change behaviour. And I also think that global agreement is needed to allow a country that takes action to impose a carbon border tax. That can be part of polycentric approach.

Conclusion

My argument in this lecture is that:

- We need social science as well as understanding of climate science if we to take effective action.
- We should follow Frank Ramsey: it is ethically indefensible to discount later generations which should count for as much as us.



- That implies spending larger sum immediately.
- In measuring harm and growth, we should include natural capital: it is not enough to say that the future will be richer in terms of GDP which is an inadequate measure.
- We should not reject the use of price signals through carbon taxes and cap and trade – they are not necessarily neoliberal projects, and can be progressive
- Action needs to be at all levels – but in considering local action and compliance, we can also encourage global agreement on border taxes. The question is to consider what forms of global action would be most appropriate.

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Further Reading

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