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**Selling pollution and safeguarding lives: international justice,  
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**Selling pollution and safeguarding lives: international  
justice, emissions trading and the Kyoto Protocol**

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## **1 Introduction**

The purpose of this paper is to examine the Kyoto Protocol in the light of three theoretical perspectives: international political economy (IPE), Nozick's entitlement theory of justice and Rawls's defence of justice as fairness. The IPE perspective highlights the difficulty of curtailing the structural power of capital, in the form of the fossil fuel lobby, to protect its interests by undermining the previously agreed objective of protecting the most vulnerable populations from dangerous climate change. The entitlement theory of justice has been used to provide support for the market-related initiatives, notably emissions trading, that introduced flexibility into the emissions reduction programme. However the extension of emissions trading to the international arena is questioned in this paper. The application of Rawls's difference principle focuses attention on the interests of those populations that are most vulnerable to the effects of climate change, who are argued here to be more numerous than is generally supposed. It is suggested that a publicly funded climate change insurance scheme is necessary and some of the difficulties it would face are discussed.

## **2 International political economy and the Kyoto Protocol**

The UN Framework Convention on Climate Change (UNFCCC) set the overall objective of stabilising greenhouse gas (GHG) concentrations in order to prevent dangerous climate change, while ensuring that food production was not threatened and sustainable economic development could proceed. Three main effects of the resulting climate change are expected. First, sea level will rise, inundating low-lying islands and coastlines. Second, agriculture in many areas will be more frequently vulnerable to disruption by drought. Third, there will be an increased risk of extreme weather events such as floods, droughts, heat waves, storms, cyclones and typhoons. All of these effects will have a bigger impact on developing countries than on the industrial world that caused the climate change. For example, coastal defences against sea level rise are feasible for the Netherlands but well beyond the financial reach of developing countries. Also, agriculture constitutes a greater percentage of economic activity in developing countries, which tend to have a large subsistence sector, with poor farmers who are unable to afford insurance. Moreover, there is some evidence, for example from the insurance industry, that extreme weather events have become more frequent over the last 30 years. It may already be too late entirely to avert the adverse consequences of global warming.

The story of the Kyoto negotiations is that collective agreements to that end were modified to add 'flexibility' through international transfer mechanisms such as emissions trading. This reflects the key clash between the desire of the European Union (EU) for a co-ordinated approach based on flat rate emission reductions and the anti-interventionist stance of the US, which was sensitive to its citizens' and industries' attachment to cheap fuel. The EU sought a flat rate GHG emissions reduction target for all Annex I (the industrial polluters) countries of 10-15%; the US and Japan aimed for an average 0-5% decrease with differentials and flexibility. The GHG emissions reduction programme agreed for the period 2008-12 can be assessed against the IPCC judgement that a 60% cut in GHG emissions is needed in order to stabilize atmospheric concentrations by 2050. The reduction targets average out as a 5.2% cut on 1990

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levels of GHG emissions by 2008-12. Friends of the Earth described this outcome as 'pitifully inadequate'. Furthermore, it may not be achieved; the US Congress has not yet ratified the Kyoto Protocol.

The history of the Kyoto negotiations shows that the initial plan for a flat-rate GHG emissions reduction target in line with the original UNFCCC objective of preventing dangerous climate change was severely weakened by the addition of 'flexibility' in the shape of differential targets and international transfer mechanisms. First, differential targets range from the EU's 8% reduction in 1990 levels of GHG emissions by 2008-12 from 7% for the US, 6% for Japan and 0% for Russia and Ukraine 0% to increases of 8% for Australia and 10% for Iceland. Second, international transfer mechanisms were negotiated, the most significant of which was emissions trading (tradeable permits), proposed by the US delegation. Given that each participating country is allowed a maximum level of GHG emissions during a set period, country A may emit more if country B emits the same amount less and sells its unused allowance to A. There is a danger that the interests of the most vulnerable populations, such as those of the Alliance of Small Island States (AOSIS) were overlooked in the bargaining over the distribution of emissions reduction targets. If so, it is important to seek the reinstatement and extension of the just principles that informed earlier stages the climate change negotiations. Why was the outcome of the negotiations, the Kyoto Protocol, so weak a response to global warming?

The answer from international political economy (IPE) is that the structural power of capital has made it possible for fossil fuel lobbies to defend their interests, to limit the scope and effectiveness of global warming regulation (Paterson, 1996; Newell and Paterson, 1998). IPE places the state in the process of capital accumulation and regards the structural power of capital as sufficient to enable fossil fuel industries to secure their interests through influencing state action in international negotiations. IPE highlights the centrality of the state in capital accumulation; the role of the state is to identify and to advance the interests of capital (Burnham, 1990). One of the principles that mediate the efforts of capital, in this context the fossil fuel lobby, to secure its interests is to maintain 'the rule of the market'. This was exemplified at Kyoto by US pressure for an agreement on emissions trading.

The negotiation of emissions trading into the Kyoto Protocol illustrates the ideological use of market discourse to moderate the impact of the GHG emission reduction programme in the interests of the fossil fuel lobby. This is by no means to imply that advocacy of market exchange is, as such and in all circumstances, necessarily ideological. Judgements of the uses to which market discourse are put must be historically specific and there are circumstances in which the introduction of market exchange can be emancipatory. The argument is that in the particular historical context of the Kyoto negotiations the appeal to the advantages of market exchange in the form of emissions trading is most reasonably interpreted as ideologically biased, that is, as serving the interests of capital.

Certainly, the representatives of capital, in this context the fossil fuel industries, lobbied strenuously in favour of a flexible approach to emissions reduction targets, including emissions trading. The fossil fuel lobby includes the coal, oil and automotive industries, states whose economies are energy intensive and countries that are dependent on the export of fossil fuels or

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on their use. The Global Climate Coalition (GCC) is a pressure group for predominantly US fossil fuel interests, that is, the coal and oil industries but also chemicals and cars. GCC ran mass media campaigns seeking to discredit scientific evidence, lobbied energetically at Kyoto and formed an alliance with OPEC countries. It is estimated that US industry 'threw probably up to \$100 million into fighting the whole process' of climate change regulation (Grubb *et al.*, 1999, p.112).

Emissions trading has economic benefits, enabling a given rate of emissions reduction to be achieved at least cost. For example, the tradable permits system for ozone-depleting sulphur dioxide in US is generally believed to have been responsible for reducing emissions efficiently. Emissions trading is also an attractive route to lower emissions for the polluting industries. Rather than dispossess them of revenue as carbon taxes do, the system creates a tradable asset – the permit. This is alchemy indeed, turning base metal into gold.

The novel feature at Kyoto was that emissions trading would be international. Economies with high abatement costs will buy permits from countries with low abatement costs. For example, Japan has high abatement costs because it is already energy efficient, while the US faces high abatement costs in the different form of political resistance from the powerful fossil fuel lobby and from voters. Russia and Ukraine are in the best position to sell surplus permits since they have zero abatement costs. In Russia and Ukraine emissions fell as a consequence of economic collapse: '... over successive months teams of US officials went to the East to explain the windfall that could be waiting' (Grubb *et al.*, 1999, p.93).

The US proposals were welcomed by the major industrial polluters but were regarded elsewhere with suspicion. Why the suspicion? One attitude to emissions trading is that it confers a morally objectionable right to pollute, that is, a right to do something that is agreed to be harmful. It is easy to dismiss this reaction as no more than '... bar-room rhetoric and denunciations in the press' (Grubb *et al.*, 1999, p.92). After all, every country is going to emit GHG at some level; prohibition is unnecessary and would be unenforceable. Nevertheless, it is arguable that the 'bar-room rhetoric' expresses the ethically right judgement and one, moreover, that vindicates the IPE claim.

It is clear that the appeal of emissions trading to the fossil fuel lobby was that is held out the prospect of allowing leading emitters to avoid taking serious domestic action. Trading could also be presented as, and would perhaps actually amount to, the US endowing Russia with resources desperately needed to modernise its inefficient economy. The kernel of truth in the moral condemnation of emissions trading is that it offends against the spirit of the UNFCCC objective of preventing dangerous climate change. The emissions reductions in Russia and Ukraine were 'free', in that they came about as the unintended side-effects of economic collapse. Rather than 'ring fence' this zero cost contribution to climate change abatement, the US proposal would allow it to be dissipated in higher US emissions. The US 'got virtually everything it wanted in terms of flexibility for Annex I commitments' (Grubb *et al.*, 1999, p.93). From the perspective of IPE, the US fossil fuel industry and the US state had acted together in deploying market mechanisms to defend the interests of the fossil fuel sector. The implication might be drawn that ethical action is powerless to achieve a just distribution of the costs of adjustment to global climate change.

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Two considerations suggest otherwise, both of which are common ground with the cited proponents of the IPE approach. First, according to Paterson (1996) and Newell and Paterson (1998), the structural power of capital is no longer a monolithic force for securing the interest of fossil fuel industries. The insurance industry, the renewable energy technologies sector and the natural gas industry, whose carbon dioxide emissions are only 60 per cent of those of coal, have aligned themselves with those states that are exerting pressure for increasing the severity of emission reduction programmes in the industrial world.

There are however two reasons for caution. Insurance companies, especially those involved in catastrophe insurance, will increasingly classify extreme weather events at least in certain areas as uninsurable (because almost inevitable) risks. And natural gas is not a significant resource for all countries. The case of the UK, where pit closures and the 'dash for gas' were prominent features of the approach to utility privatisation, is not typical. On the other hand, pressure from environmental groups and green consumerism are other ways of transforming capitalism. It is possible that in the future the interests associated with renewable energy such as solar and wind power and new technologies such as cleaner fuels and fuel cells will erode the unity of capital.

Second, it is arguable that exchange is always imbued with a cultural as well as an economic tone, in that agents are never purely rational and self-interested but are also motivated by reciprocal obligations (Blau, 1964). The global climate change negotiations are therefore likely to involve the exchange of gifts, in the sense of benefits or concessions that incur obligations to reciprocate. Paterson (1996) makes the same point: 'institutions stabilize expectations about others' actions, so that states know their co-operation will be reciprocated' (p.182). Among the institutional factors that tend to stabilize agents' expectations are shared norms and values, among which may be included principles of justice in the distribution of the costs of adjustment to global warming.

This suggests that it is important to undertake a critical discussion of the theoretical foundations of these norms. Section 3 therefore offers a critique of the entitlement theory of justice, which was a source of theoretical support for market-related initiatives negotiated at Kyoto. In section 4 the use of Rawls's difference principle in the interests of the worst off parties, that is, those that are most vulnerable to the effects of climate change, is questioned and found to be problematic.

### **3 The entitlement theory of justice and the Kyoto Protocol**

The theoretical argument for the fairness of bilateral exchange, exemplified by the emissions trading proposal, is identified by Muller (1999) as the entitlement theory of justice (Nozick, 1974).

#### **3.1 The entitlement theory of justice**

This sees the free or competitive market as the institutional structure that settles distributional issues. The idea is that, provided economic agents are entitled to hold their initial bundle of

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goods, any redistribution of those goods which comes about through voluntary exchange will leave agents with goods that they are entitled to hold. Whether a distribution is equal or unequal, or patterned in any way at all, is of no concern, provided only that it was arrived at by agreeing contracts to transfer legitimately held goods.

There are two central principles of the entitlement theory. The first is that a distribution of holdings is just if everyone is entitled to the holdings they possess under that distribution. The second is that a person is entitled to a holding if they acquired it in accordance with the principles of justice in acquisition or it was transferred to them in accordance with the principles of justice in transfer.

Assume for the moment that agents acquired their goods and resources justly and are entitled to hold them. This 'pre-transfer' distribution of holdings is therefore just in that it has been arrived at in accordance with the principles of justice in acquisition. Nozick argues that any subsequent distribution of holdings (of goods and resources) is also just, provided that it is the end-result of a series of transfers in which no one's entitlements (or rights to hold goods and resources) were violated. This is essentially the principle of justice in transfer. Transfers of holdings that do not violate entitlements preserve justice, in the sense that a distribution of holdings which is the end result of a process of entitlement-respecting transfers (starting, remember, from justly acquired holdings) is itself just.

The implication is that any distribution of goods is just if it was arrived at only through market transactions. This historical or process approach to distributive justice therefore validates any distribution of goods, no matter how unequal, providing it was arrived at justly.

Clearly, the entitlement theory does nothing to rule out the use of structural power by private agents, provided it was acquired through repeated acts of voluntary exchange. But justice is a contested concept and perhaps the point that Nozick is making is precisely that inequalities in the ownership of (justly acquired) private property and the structural power it confers are just.

### **3.2 Applying the entitlement theory of justice**

The entitlement theory underlies the argument for 'grandfathering' as the basis for the allocation of emissions trading quotas. A grandfathering distribution means that each year countries receive (tradeable) permits in proportion to their baseline emissions, that is, the biggest polluters get the most. The main alternative is a *per capita* distribution, so that each year countries receive permits in proportion to their population. A lot hangs on this: the OECD countries would receive 50% of permits under grandfathering but only about 20% under a *per capita* distribution.

The argument for grandfathering, as reported by Muller (1999, pp.8-9), opens with the premises that anthropogenic GHG emissions are a by-product of wealth creation and that everyone is entitled to a share of the created wealth in proportion to their contribution to the wealth-generating process. It is argued that *a fortiori* everyone is entitled to an appropriate

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proportion of the acceptable use of common amenities in this process. The conclusion is the transfer of these justly acquired entitlements is therefore morally legitimate, fair and just.

It is beside the point to draw attention to the grossly unequal distribution of the wealth created through using the common amenity, that is, the atmosphere. For the entitlement theorist, any pattern of distribution is just, provided it is the outcome only of legitimate transfers. What is needed is an internal critique of the entitlement theory. Perhaps it does not consistently apply the Lockean principles on which it is based (see below). The intention is not to discover a formal contradiction in the application of the entitlement theory of justice to climate change regulation but to draw attention to evidence in the historical source of the theory that suggests a failure to remain true to the spirit of this account of justice. In matters of justice and virtue, a rhetorical flourish of this kind, if that is how it is understood, may properly be more telling than the allegation of an interminably contestable logical flaw.

What exactly does it mean to acquire holdings of goods and resources ‘in accordance with the principles of justice in acquisition’? The basis of Nozick’s argument is the principle put forward by the 17th century English philosopher John Locke, that a person justly acquires land (or, as we would say today, resources) by ‘mixing’ his or her labour with it. It is well known that Locke added a proviso to his account of justice in the acquisition of property. The ‘Lockean proviso’, as Nozick refers to it, is that acquisition (by mixing labour with resources) is just, providing that ‘enough and as good is left in common for others’. In Nozick’s view, the Lockean proviso would be violated only in a catastrophic or ‘desert island’ situation. For example, the requirement to leave ‘enough and as good for others’ entails that ‘a person may not appropriate the only water hole in a desert and charge what he will’ (p.180). Outside extreme situations of this kind, Nozick argues that ‘the free operation of a market system will not actually run afoul of the Lockean proviso’ (p.182) and he concludes that the Lockean proviso ‘will not provide a significant opportunity for future state action’ (p.182).

It is arguable, however, that Locke’s account of property, from which the entitlement theory derives, admits of an alternative interpretation, which would sanction state intervention in pursuit of a radically egalitarian redistribution of resources. The fact is that there is another ‘Lockean proviso’: ‘As much as anyone can make use of to any advantage of life before it spoils, so much may he by his labour fix a property in. Whatsoever is beyond this is more than his share, and belongs to others.’ This was a powerful constraint on accumulation in the 17th century when methods of preserving food were very limited and there were few durable manufactured goods. As this changed during the 19th century Locke’s qualification on the acquisition of property seemed to be no longer applicable (Doyle, 1963 , p.279). But the accumulation of food beyond what can be consumed before it decays may be seen as a metaphor for the degradation of the environment.

The principle that seems to be implicit in the second Lockean proviso is that a natural resource may be used ‘to any advantage of life’ up the point at which it is degraded, when ‘it belongs to others’, that is, the right to further exploitation is forfeited. In accordance with this principle, industrial countries, by degrading the global climate through CO<sub>2</sub> emissions, forfeit the right to continue to emit CO<sub>2</sub> and other greenhouse gases. The implication is that bilateral transactions such as emissions trading would fall into the category of ‘blocked exchange’ (Walzer, 1990).

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The US, for example, forfeits at least the right to emit more than is consistent with the 7% reduction on 1990 levels and hence the right to exceed that total by buying unused emissions quotas from other countries. And for the industrial countries in general there is no basis in justice for the grandfathering solution to the problem of the allocation of emissions trading quotas.

## **4 A Kantian constructivist theory of justice and the Kyoto Protocol**

The main focus of this section is on Rawls's Kantian constructivism. The Rawlsian difference principle, according to which inequalities are permitted only if they are to the greatest advantage of the least advantaged, features in the literature on justice and global warming (Schokkaert and Eyckmans, 1999).

### **4.1 Rawls's theory of justice as fairness**

Rawls' aim is to show that there is a coherence between 'our considered moral judgements' and 'the principles that would be chosen by rational beings' (p.50). In response to communitarian questions about latent metaphysical assumptions, Rawls later founded the principles of justice on the claim that they are embedded in the culture of liberal democratic societies (Rawls, 1985; 1993). The liberal theory of justice put forward by Rawls (1972) seeks to justify economic institutions with a 'tendency to equality' (p.100) without departing from the liberal interpretation of human nature as rational and fundamentally self-interested, which informs neoclassical economics. However, justice is widely believed in liberal democratic societies to involve impartiality and self-interest is incompatible with impartiality. The solution is to deny self-interested agents the information they would need to pursue their own interests.

In 'the original position' (pp.118–92), a hypothetical situation in which a number of individuals negotiate the rules that will regulate their subsequent economic and social life together, the contracting individuals are placed behind a 'veil of ignorance' (pp.136–42). They are not allowed to know their positions in the future society, nor their skills, talents or tastes. The set of economic and social rules that emerges from this original position has a good claim, Rawls suggests, to be considered as the principles of justice.

There are two principles of justice. First, the principle of equal liberty states that 'each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others' (p.60). The interpretation of this principle depends on the meaning of the term 'basic liberty'. Rawls defines basic liberties as '(the right to vote and to be eligible for public office) together with freedom of speech and assembly; liberty of conscience and freedom of thought; freedom of the person along with the right to hold (personal) property; and freedom from arbitrary arrest' (p.61).

Second, the difference principle or 'maximin' states that 'Social and economic inequalities are to be arranged so that they are ... to the greatest benefit of the least advantaged' (p.83). Rawls argues that rational individuals would agree on this principle because they do not know whether

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they will be among the most or the least advantaged members of the future society. If Rawls is right in thinking that rational individuals are risk averse – and it is a controversial proposition – then, from behind the veil of ignorance, they will be anxious to ensure that the worst position in which they might find themselves is as good as it possibly can be.

What counts as a good position, in Rawls's view? The answer is that well-being is understood in terms of having access to 'primary social goods'. These are the things that a rational person wants whatever else he or she might want, and which it lies within the scope of social life to provide, the most important being 'rights and liberties, opportunities and powers, income and wealth' (p.92).

#### **4.2 Applying the Kantian constructivist theory of justice**

The UNFCCC objective to stabilize GHG concentrations to prevent dangerous climate change seems to be consonant with the difference principle. Preventing dangerous climate change would make the most vulnerable parties as well as they would have been in the first place, in the absence of any anthropogenic climate change at all. However, the application of Rawlsian justice to the Kyoto Protocol, using it to support this objective, is problematic.

The value of the difference principle is that it focuses attention on the plight of the least advantaged group. It is generally assumed that, among the participants at Kyoto, the members of AOSIS have an incontrovertible claim to occupy this position, because climate change threatens their very existence. Rising sea levels could lead to states such as the Maldives disappearing under water. However, climate change involves the more frequent occurrence of extreme weather events, at imperfectly predictable locations, which introduces an element of uncertainty into the identification of the worst off group. This problem can be solved by making use of information collected by insurance companies as part of their commercial activities.

It is clear that 'the consequences of inevitable gradual sea level rise will not be insurable' (Wilford, 1993, p.179). The inevitability of an event means that it is an uninsurable risk; a commercial insurance company offering to cover such risks would face insolvency. There will therefore be a 'substantial shortfall' in coverage of losses from extreme weather events. Insurers are already declining to insure 'certain risks in particular areas' and 'will be forced to refuse to insure risks in the geographical areas most prone to catastrophic loss' (*ibid.*). The withdrawal of commercial insurers from certain risks and from certain geographical areas in these circumstances amounts to an identification of the populations that are most vulnerable to 'dangerous climate change'. As soon as populations incur uninsurable risks because of anthropogenic climate change, they become members of the worst off group. AOSIS in fact proposed a publicly funded insurance scheme at an earlier round of climate change negotiations. There seems to be a strong case not only for installing such a scheme, but also for extending it to areas denied commercial catastrophe insurance cover.

A more intractable difficulty surrounds the formulation of the difference principle in terms of maximizing the position of the least advantaged group. Would rational agents negotiating behind a veil of ignorance agree to maximize the position of the worst off members of society? Let us

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describe the maximin principle of seeking institutional arrangements that make the worst off members of society as well off as they can possibly be as ‘maximizing the floor’. Then there are at least three other principles that rational agents in the original position could choose (Mueller , 1989, p.421). These are maximizing the average level of well being, maximizing the average, subject to a floor constraint, and maximizing the average, subject to a range constraint. So the impartiality that is afforded by the Rawlsian original position is not enough to guarantee that rational agents would adopt the difference or maximin principle. While the well being of the worst off group will be taken into consideration in some way under all of the alternative principles, the aim of the contracting parties will not necessarily be to maximize it.

Even if that is their aim, it is far from clear what would count as maximizing the well being of the worst off group. Suppose that the contracting parties achieve a rate of gas emissions reduction that fails to avert the threat of catastrophic flooding of the islands and low-lying states that comprise the members of AOSIS. Would it be just to allow these populations to trade-off emigration from their island and low-lying home countries before they are submerged, in exchange for citizenship in another country plus financial compensation? In other words, would rational agents behind a veil of ignorance be likely ever to tolerate this outcome?

There is no unequivocal answer to this question. Two possible answers reflect two descriptions of the greatest possible advantage to the populations of, for example, the AOSIS countries that rational agents behind a veil of ignorance might entertain. First, they might take the view that the right to continued occupation of national territory is intrinsic or inalienable. It takes priority over all other primary social goods and so cannot be the subject of trade-offs or compensation of any kind. Second, they might, instead, believe that the right to indefinite or unconditional occupation of national territory is just one primary social good among others and is one that can legitimately be traded-off against access to other social goods. In that case rational agents would choose to set up an insurance scheme, offering AOSIS populations citizenship in countries that are safely above sea level plus financial compensation. The Rawlsian procedure cannot rule out the compensation option because the difference principle is defined in terms of maximization. It is always possible that rational agents would judge that relocation plus financial compensation puts the most vulnerable populations in a better position than continued existence in at least relative poverty on land vulnerable to natural catastrophes.

There are two reasons for being anxious about the implications of this option. First, moral hazard is a perennial problem of insurance. The motivation for the AOSIS proposal stemmed from belief that their weak bargaining position would not permit them to negotiate an emissions reduction programme strong enough to prevent dangerous climate change. However, climate change insurance would open the door to moral hazard, since it would give industrial countries an incentive to maintain emissions close to existing levels. If industrial countries continue to enjoy unchecked economic growth, they could compensate AOSIS members out of their higher national incomes and still be better off than under a stringent emissions reduction programme. The difference principle reinforces the dangers of moral hazard, because it can be interpreted as demonstrating the possible optimality of climate change insurance for the AOSIS populations, too. The problem is that such a course of action would be unsustainable.

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Second, rational maximising agents may not be representative of all the populations vulnerable to the adverse effects of climate change. These populations are likely to include people who see themselves as communitarian moral agents, whose identity as such is defined at least in part in terms of local attachments. Belief in an inalienable right to continued occupation of national territory might be among the commitments to follow from such ties. Embedding a respect for such rights in climate change regulation would acknowledge an entitlement to withhold property from exchange. A case might be made for including such rights among basic capability rights (Sen, 1982; 1993). Property rights of this sort would also function as a device for diminishing moral hazard, by placing industrial countries under an obligation to curb GHG emissions sufficiently to prevent dangerous climate change. This would restore publicly funded climate change insurance to a role as last resort in the face of unpredictable extreme weather events.

## **5 Conclusion**

The initial plan at Kyoto for a flat-rate GHG emissions reduction target in line with the UNFCCC objective of preventing dangerous climate change was severely weakened by the addition of 'flexibility' in the shape of international transfer mechanisms. The use of market mechanisms threatens the achievement of the objective of preventing dangerous climate change and can be interpreted as a defence of the interests of capital, in the shape of the fossil fuel industries, at the expense of justice towards the most vulnerable populations.

The conclusion that has been reached about emissions trading should be confined to domestic and to intra-firm transactions. Bilateral exchange between unequal partners in the international sphere is unlikely to be just. The blocked exchange argument from the second Lockean proviso reinforces this conclusion. On this argument the US, as the biggest polluter, would be obliged to commit itself to the most stringent emissions reduction target and would forfeit the right to exceed that total by buying unused emissions quotas.

The Rawlsian difference principle directs attention towards the most vulnerable populations. This group certainly includes the populations of AOSIS states but its membership needs to be extended to include populations at greatest risk of damage from extreme weather events. The withdrawal of commercial insurance cover from risks related to global warming reveals the insurance industry to be in effect the whistleblower on unsustainable capitalism. At some point the Annex I parties are going to have to accept responsibility for compensating the victims of floods, droughts and other extreme weather events linked to global warming. Potential victims are much more numerous than is generally assumed, the costs of compensation correspondingly greater and the incentives to reduce GHG emissions that much more powerful.

## **Appendix**

### **Global warming**

The central estimate of the 1990 Intergovernmental Panel on Climate Change (IPCC) report was that a doubling of atmospheric concentrations of CO<sub>2</sub> would raise global mean temperature by 2°C (+1.5°C). On current trends atmospheric concentrations of CO<sub>2</sub> are predicted to double by 2050.

Three main effects of the resulting climate change are expected.

### **Rise of sea level**

A rise in sea level of 1 metre would inundate 3% the earth's land surface. IPCC predicts a rise of 50cm by 2100. The areas affected by such a rise in sea level include AOSIS countries such as the Maldives, and the Seychelles, 6% of the land area of the Netherlands, river basins such as those of Nile, Mekong, Mississippi and Amazon and 70% of the coastline of Eastern England. Adaptation in the form of coastal defences is feasible for the Netherlands but not for developing countries.

### **Effects on agriculture**

The main effect is likely to be a greater potential for drought. This would have a bigger impact on developing countries where agriculture accounts for a larger percentage of economy and there is a large subsistence sector, with poor farmers unable to afford insurance.

### **More extreme weather events**

An increased risk of extreme weather events such as floods, droughts, heat waves, storms, cyclones and typhoons is predicted. There is some evidence that climatic events on such a scale have become more frequent over the last 30 years. For example, the 1998 floods in Bangladesh left two-thirds of the country under water.

### **International transfer mechanisms**

#### **EU bubbling**

The EU departed from its own aim of a flat rate emissions reduction target by arguing for differential targets across EU countries averaging 8%. The argument was that EU exhibits a unique degree of economic and political integration. However the EU was forced to accept a proposal to permit any group of countries to redistribute their emissions reduction targets. This made it impossible to maintain a flat rate target and to resist international emissions trading.

The US delegation agreed to a cut of 7% on 1990 levels and Japan to a 6% reduction. Russia and Ukraine were set a 0% target, while Australia and Iceland negotiated increases in emissions of +8% and 10% respectively.

#### **Emissions trading**

Each participant is allowed some maximum level of GHG emissions during a given period and is permitted to trade these allowances, also known as tradeable permits. So country A may emit more if country B emits the same amount less and sells its unused allowance to A.

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**Joint implementation**

Joint implementation (JI) agreements involve bilateral exchange between countries, both of which are achieving their emission reduction targets. Before Kyoto, JI projects generally involved an industrial country as investor and a developing country as host. At Kyoto it was agreed that investment projects in one Annex I host country may generate emissions reduction units in the investing country.

**The clean development mechanism**

This is similar to JI agreements; the host is a developing country and the investment generates emissions reduction credits for the investing Annex I country. The difference is that the CDM entails a greater degree of multilateral control over investment projects than the bilateral JI agreements allowed.

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