



Education for Climate Justice

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Climate justice requires sharing the burdens and benefits of climate change and its resolution equitably and fairly. It brings together justice between generations and justice within generations. In particular it requires that attempts to address injustice between generations through curbing greenhouse gas emissions do not end up creating injustice in our time by hurting the presently poor and vulnerable. This essay considers the transformative power of education in its many dimensions as one entry point into expanding the scope of policy instruments for climate justice. First, education can change behavior, primarily in rich countries but also in poor countries, and thus help mitigate climate injustice between the generations. Second, resources targeted to the education of the poorest in poor countries can help their development but also help to counter some of the negative spillover effects of interventions to mitigate climate change. Hence the title of this essay - Education for Climate Justice.

Introduction

The Stern Review famously stated that climate change is the biggest market failure the world has ever seen (Stern, 2006). The Review was referring to the inability of market mechanisms to adequately price in the future societal costs of present economic activity. Markets are also not known for necessarily achieving social and distributional justice objectives by themselves (Stiglitz, 2012). The combination of market failure and distributional failure is fundamental to the climate change discourse and to the dialogue on climate justice, which contributes to sharing the burdens and

benefits of climate change and its resolution equitably and fairly.

Two dimensions of justice need to be borne in mind in the discussion of climate change. The first is of course justice between the generations, ensuring that the present generation carries forth its stewardship role in what it bequeaths to the unborn generations to come. The second dimension, however, is justice within the generations, in particular justice within our own generation – justice in our time. It is easy to equate justice between the generations with addressing failures in markets that are meant to stretch across time,

in other words pricing of present economic activity to take into account its impact on future generations. Indeed, little distinction seems to be made between these two in the climate change discourse. However, justice in our time is a separate, albeit related, issue which needs to be assessed and addressed on its own terms. Particular attention needs to be paid to the use of policy instruments which, while addressing intergenerational justice, may heighten intra-generational injustice.

This paper argues that education plays and will play a key role in addressing the twin dimensions of climate justice, between and within generations. The failures of markets to price costs and benefits appropriately over time, and the intergenerational justice to which the failure can give rise, can be mitigated to a significant extent by educating present generations about the future costs of their actions so that they will themselves factor in these costs in their decisions and thus give markets the right signals on pricing. Recent development in behavioral economics establish the scientific foundations of the claim and also give guidance on how education combined with policy can contribute to a more environmentally aware population.

Justice in our time, and especially guarding the interests of the presently vulnerable so that interventions to safeguard the future against climate change do not come at their expense, also turns out to require education in at least two senses. First, to the extent that assistance for compensation is necessary then assistance to the vulnerable in the form of educational investment has high priority in its own terms. Second, global education to heighten awareness of ethical issues in climate change, especially for citizens

of wealthy countries, can lay the foundations for protecting today's vulnerable populations as well as building a constituency for climate change interventions. Thus we can harness the transformative power of education for climate stewardship.

The plan of the paper is as follows. Section 2 elaborates on the intersection of market failure and distributional failure in the climate change discourse, as a prelude to developing arguments for the transformational role of education in climate justice. Section 3 takes up the role of education in mitigating market failure in weighing up costs and benefits across the generations, especially in light of recent Nobel Prize winning contributions to behavioral economics. Section 4 turns the spotlight on the implications of climate change interventions for justice within our own generation and the many senses in which education can play a role in addressing this dimension of climate justice. Section 5 concludes by emphasizing the policy implications of the arguments presented in this paper.

Market Failure, Distributional Failure and Climate Justice

What exactly are “market failure” and “distributional failure”, and why do they matter to climate justice? Answers to these questions are important to provide the bearings which locate the role of education in climate justice.

When a market works well it balances out supply and demand, and establishes a price that serves as a marker of the scarcity of the commodity being traded on that market. When the scarcity signals work well relative to each other, they induce shifts in supply towards

commodities which are scarce, and shifts in demand away from these commodities. If the system of markets and prices works as it is meant to in economics text books, then it will achieve an outcome that is economically efficient. In common language, it will lead to total economic wellbeing as large as possible given the overall resources of the economy.

Some markets do approximate to well-functioning text book markets, and it would be foolish to disregard the basic economics of such markets. As policy makers over the years have discovered, undue interference in some markets, albeit well meaning, can have major unintended consequences, like the creation of parallel black markets in foreign exchange which were a familiar feature of many low income countries until the liberalization waves of the late twentieth century.

However, many, perhaps most, markets do not function well, in the sense that their operation leads to prices which do not signal appropriate social scarcity. Indeed, there may be a perverse effect where the market underprices precisely those commodities which are socially most scarce. These are commodities, in particular, whose consumption cannot be parceled out and priced individual by individuals, a key requirement for the role of prices in signaling scarcity (for a standard text book treatment of these issues see Cornes and Sandler, 1996). Furthermore, markets do not come into being spontaneously. Some market maker has to find it profitable enough to create the market in question. This may not be the case for some commodities so those markets may simply not exist and thus price signals for those commodities will not exist.

It matters a lot, then, which market we are talking about. Dockside markets for fish

brought in by fishermen that day may well come close to the text book model, and indeed that was the example used by Alfred Marshall, one of the founders of the modern discipline of economics, in the nineteenth century (Marshall, 2014). However, markets for goods to be delivered in the distant future, or markets for goods whose consumption cannot be individualized, or goods whose production and consumption has significant spillover effects on others which are unmediated by markets, are a different matter.

Interestingly, before turning to climate change and in preparation for the discussion in later sections, it can be noted that education is indeed such a commodity. Investment in education for an individual, or for that individual's family, comes today but the return will be reaped in an uncertain future. While it can plausibly be argued that education can be parceled and monitored as investment in a specific individual, the social returns to education go beyond the return to an individual and depend moreover on the education embodied in others. It is in this sense that markets for education cannot fully signal the true social value of education at the individual level, and hence the case for public intervention in this sector.

Climate change also involves precisely such commodities as make the operation of markets inefficient or non-existent. A greenhouse gas polluter is in effect consuming clean air, which cannot very easily be marketised into bundles to be bought and sold. Further, the consequences of greenhouse gas pollution, going well beyond straightforward reduction of clean air in the future to temperature change and its repercussions, will be borne by generations yet unborn. Clearly, a

market where they can express their demand for clean air to today's consumers of clean air (in other words, today's polluters) simply cannot exist. And when such a market does not exist, there is not a price which can signal scarcity value and overconsumption of clean air, and the environment more generally, will continue apace.

This is the market failure which the Stern Review spoke of. It leads, in simple economic logic, to inefficiency in the economy seen as stretching across the generations—both generations could be made better off if this market failure could be fixed. Of course, the outcome can also be indicted on grounds of intergenerational justice. Future generations, having no economic clout in today's markets, nor political voice in today's policy decisions, are forced to bear the costs of this generation's overconsumption as the result of underpricing of environmental goods. An alternative perspective, for example one based on the moral imperative of stewardship of resources by each generation, would likely come to the same conclusion. An interesting case, perhaps, of two seemingly opposed perspectives, the economic and the moral, coming together in the case of climate justice.

But justice cannot simply be confined to justice between the generations; it also has to be addressed and advanced within generations—within future generations of course but particularly within the present generation. One way to think about distributional justice within a generation in the context of a market economy is to use the simple statement that income can be seen as the value of an asset times the return on that asset. Thus capital income is the value of capital owned by an individual times the rate of return on the

capital. Labor income is the amount of human capital embodied in an individual times the wage accruing to labor of that skill level. And similarly for other assets such as land, and of course physical and human capital can be divided up into many constituent parts of assets of different types. The basic point is that final inequality is composed of the inequality of assets across individuals and the inequality of rates of return to these assets. Market processes determine the rates of return which, given the historically inherited asset inequalities, generate inequalities of outcome, which in turn lead to the next round of asset inequalities and so on into the future. Note that education once again plays a key role, this time in distributional equity, because of its central role in determining the inequality of human capital.

Addressing the biggest market failure the world has ever known, achieving justice between generations, and at the same time not compromising the wellbeing of the poor and vulnerable of the present generation, is a tall order indeed. It is a basic precept of policy economics that the number and type of policy instruments has to match the number and type of social objectives.¹ Otherwise some social objective or the other will have to give way, the only question being which one. An analogy would be trying to fit a room with too small a carpet. Whichever side of the room one starts with, in the end one part of the room will be left wanting. The only answer is to either make do with part of the room uncarpeted, or to get a bigger carpet. Translating back to the policy world, the only answer is to either let go of some objectives, or to search for new policy

¹ This is related, in macroeconomics, to the Tinbergen Principle, after the Nobel Prize winning economist Jan Tinbergen.

instruments. The following sections will argue that education provides one such class of policy instruments which, in its many manifestations, can help in the simultaneous achievement of the ambitious goal of climate justice, sharing the burdens and benefits of climate change and its resolution equitably and fairly.

Education and Market Failure

The classical approach in economics to mitigating market failure is to introduce corrective taxes or subsidies which change the price in the market in question to better reflect social scarcity. The simplest and best known example is when the output of a polluter, who is using up clean air or clean water without paying for it, is taxed to account for the full social costs of the inputs being used (Cornes and Sandler, 1996).² Similarly, if a commodity or an activity with social benefit is priced too low, then a price subsidy would be called for. As argued in the last section, the market for education has features which tend to undervalue the social benefit of private investment, and thus a subsidy of some form may be in order.

Taking up then “the biggest market failure the world has ever seen”, through the inability of markets to appropriately price in the future costs of current emissions of greenhouse gases, and thus of the economic activity which leads to it, it follows that the correct response is to tax these emissions, and to subsidize activities which do not lead to these emissions. Leaving to one side much technical detail and nuance, in principle if we could find enough tax and subsidy instruments, including subsidizing

research and development for clean energy, we could “solve” the market failure problem of climate change. In doing so, we would also in principle address the problem of justice between the generations, since their inability to influence current prices would be corrected for through the tax-subsidy instruments. Of course, to the extent that the instruments available were limited, the problem could only be addressed partially.

The central problem faced by policy makers in translating the prescription of basic economics for correcting market failure is indeed the limited set of instruments at their disposal. A carbon tax, for example, will have knock on effects on the economy, some of which may be undesirable and which may need to be fixed through other tax-subsidy instruments, which may in turn not be simple or straightforward to implement. A carbon tax will also have distributional impacts, which will be taken up more fully in the next section, and the instruments needed to address and redress these repercussions may be technically or politically infeasible.

The more instruments there are, the easier is the policy makers’ task in mitigating the market failure of climate change. Consider then the following line of argument which points to a class of instruments which are not given as much prominence in the climate change discourse as they should. The argument turns on questioning the text book economics model of the basis on which individuals make their production and consumption decisions. This assumes, for example, that individuals base their market decisions after full reflection on the consequences. Further, it assumes that they take into account the consequences only for themselves and not for others or, even if they

² In economics these are known as Pigouvian taxes, after the British economist of the early twentieth century, Arthur Pigou.

do, the collective good of society as a whole is no part of their calculus. These assumptions have been questioned by the branch of economics known as behavioral economics, and its findings have strong implications for policy responses to climate change.

The award of the Nobel Prize in economics to the psychologist Daniel Kahneman recognized an ongoing revolution in economics. Under the broad heading of behavioral economics, insights from the psychology of human behavior are being incorporated into models of market behavior. Alongside the Nobel Prize to Kahneman, other signs of a shift in thinking are the award of the Clark Medal to Matthew Rabin, and the MacArthur “genius” award to Sendhil Mullainathan.³ Behavioral economics is a broad and deep tectonic movement in the way economic behavior of individuals, and thus the interpretation of price outcomes in markets, are conceptualized and quantified (Kahneman (2011); Camerer, Lowenstein and Rabin (2003); Datta and Mullainathan (2014)).

Among the many dimensions of behavioral economics, two related insights are particularly important for the climate change discourse. First, individuals have two systems of cognition and response—“thinking fast and thinking slow”, to paraphrase the title of Daniel Kahneman’s hugely popular general book on the subject (Kahneman, 2011). The thinking fast part is instinctive and makes quick classifications of signals received in order to formulate a response. This part of behavior is more emotional and short term in nature. The thinking slow part is reflective and longer term

in nature. “Hot” and “cool” states are one way in which this dichotomy has been characterized. Another characterization is that the individual is in effect made up of two individuals, with the “cool state” longer term thinking individual attempting to set the frame for the “hot state” short term thinking counterpart. This is the characterization which allows us to make sense of individuals putting restrictions on themselves and their possible future behavior. Ulysses tying himself to the mast to stop him being pulled towards the calls of the sirens is the manifestation of this behavior in antiquity, or at least in the literature of antiquity. But the underlying forces of nature are instantly recognizable in their modern guise—from cooling off periods in divorce proceedings, through various commitment devices to promote savings, to simple statements such as “take those peanuts away from me,” none of which would make sense in the rational choice world of text book economics.

A second way in which behavioral economics can change the way in which choices affecting climate change can be conceptualized is its recognition that humans are social beings who are hard wired to care about collective outcomes. Perhaps the most striking demonstration of this is an experimental game, played by two individuals, called “the ultimatum game” (Alvard, 2004). There are, say, one hundred dollars on the table. One individual is asked to propose a division of the total between the two. If the other individual accepts, the division stands and the two walk off with their respective shares. But if the other individual does not accept, the total sum is lost and neither individual gets anything. The rational choice based outcome would be as follows. For the second individual, any money is better than no money, so he would be willing to

³ The Clark Medal is the award given annually by the American Economic Association for the best American economist under the age of 40.

accept any amount no matter how small. Knowing this, the first individual proposes only a penny (say) for the other, which is accepted and the game is over.

However, when this experiment is run in practice, and it has been run thousands and thousands of times in very many settings the world over, this is not the outcome that is observed. The proposed divisions are much closer to 50/50—not quite 50/50, but not 99/1 either. Why? The answer is that a proposal of 99/1 would so offend the second individual that he would walk away rather than accept such a blatantly unequal division. Knowing this, the first individual would not propose it. This and many other experiments suggest a strong inbuilt sense of social justice in individuals when faced with explicit choices which test the limits of equitable outcomes.

These two features of behavioral economics, and these are two among many⁴, are directly relevant to the role of education in mitigating the market failure that is climate change. The reason there is a market failure is that prices in markets are not reflecting true social scarcity, especially taking into account the wellbeing for future generations. This is because it is technically not possible for greenhouse gas emissions to be fully parceled out and priced individual by individual (although it is possible to do this to some extent, of course), nor is it possible for future generations to express their demand for lower carbon emissions in today's markets. But what if the consequences of climate change for future generations were internalized in the psychology of the present generation? Then, presumably,

⁴ For a fuller range of insights from behavioral economics, see Camerer, Lowenstein and Rabin (2003)

their demands would reflect these factors and therefore market prices would do so as well.

Thus alongside carbon taxation as a tool of climate justice between the generations, we now have education as a powerful tool in the arsenal of policy makers. Building on the insight that individuals do have social preferences, but that what is needed is for this long term perspective to frame their short run behavior, education at all levels emerges as an instrument for mitigating the market failure of climate change. This ranges from education about the consequences of climate change and its causes based on the scientific evidence, to “nudging” individual consumers towards changing their consumption patterns and levels (Thaler and Sunstein, 2008), and inducing owners and managers of firms to take on board climate change as part of social responsibility. Thus education can be in the shape of formal classes about climate change at school and college, and educational messages delivered through social media. None of this reduces the role of conventional economic tools of taxes and subsidies, but as noted earlier these instruments by themselves will not be enough. The new science of behavioral economics provides a powerful platform for reshaping education as a tool for addressing the market failure that is climate change.

Education and Distributional Failure

Addressing climate change as market failure requires corrective action which changes price signals to discourage the types of production and consumption today which lead to greenhouse gas emission and temperature increase. The intervention can address prices directly through taxes and subsidies, or

indirectly through changing patterns of demand and supply through education. But such corrective action, while it addresses the issue of justice between the generations, can have significant and profound effects on distributional outcomes within our own generation.

A clear example is provided by the carbon tax, or any other intervention which discourages the production of fossil fuel. This is good for lowering greenhouse gas emissions, but it will lower the income of coal producers, and those who are dependent on coal for energy in their economic activity. More generally, those who are heavily dependent on fossil fuel based energy for their development will lose out in the short term from any policies which lead to a reduction in fossil fuel usage. And, depending on the sort of adjustment one has in mind, the “short term” could last at least a couple of decades. It is not surprising, then, that countries like India which are heavily coal-dependent for their energy needs are wary of the carbon tax argument. Another example of the knock on effects of attempting justice between the generations, on justice within the present generation, is that of bio-fuels. These have been encouraged through subsidies in recent years, one justification being that they will substitute for greenhouse emitting fossil fuels. However, expansion of crops for bio-fuels reduces land available for food crops, which raises their price (Wright, 2014). This increase benefits producers of food crops, some of whom will be poor, but it hurts those poor who do not produce food but spend most of their income on food for consumption. Thus use of standard tax-subsidy instruments to “fix” the market failure of climate change need not be entirely benign on the poor and the vulnerable of the present generation.

What is the answer to the dilemma of addressing justice between generations without intensifying injustice within the present generation? The answer has to be to seek out more policy instruments. These can be instruments whose distributional effects on present generations are not as negative as others. But, if this is not fully successful, then we need instruments which correct the negative present distributional consequences of addressing the market failure into the future. At the most general level, these will have to be instruments of compensation, although they need not be literally compensation in the form of funds handed over.

For example, resources devoted to research and development on energy efficient production, tailored to the needs and circumstances of the poor in poor countries, is not a direct transfer. But if the outcome of this research is made freely available, it can help to mitigate the effects of carbon taxes for an economy which is heavily dependent on fossil fuel energy. At the same time, accepting that attempts at mitigation of climate change through reducing greenhouse gas emissions cannot address the climate change effects which are already “baked in” due to past emissions, resources could be devoted to adaptation to climate change. Resources devoted to research and development on managing the consequences of sea level rises, or more frequent and violent typhoons, would address injustice in our time if they were devoted to the needs of the poorest.

Consider now the case of direct transfers in the form of development assistance, to address the negative knock on effects on the presently vulnerable, of interventions to manage climate change.

Straightforwardly, alongside the investments discussed above to create resilience against the effects of climate change, there could be direct transfers of resources when climate events do occur despite mitigation and adaptation efforts. Such transfers are already discussed as part of a broader discourse on addressing the causes and consequences of macro level crises for the poorest of the poor, whether these crises are the result of financial contagion, infectious diseases, or climate related events (Kanbur, 2009). However, the transfers can also be longer term investments in human capital which lay the foundations of growth and development.

A range of such investments are possible and are the staple of discussions on the future of development assistance. However, along with investment in health, education usually tops the list of priorities for developing countries. The reasoning behind this prioritization has already been discussed in a previous section. Inequality in human assets is a root cause of income inequality and other types of inequality in society, and inequalities in educational achievements are severe in the poorest countries. It is also at the heart of the transmission of inequality across generations, as poorer parents bequeath lower educational investment to their children in an ongoing spiral. Further, educational inequality is a key dimension of gender inequality, and mother's education is a key causal determinant of children's health (Fiszbein and Schady, 2009, and World Bank, 2011).

There is a continued need for investment in basic education to lay the foundations for equitable development. Education was one of the key Millennium Development Goals (MDGs), and will continue

to be prominent in the post-2015 Sustainable Development Goals (SDGs). For poor countries, the short term negative consequences of climate change mitigation measures, for example through a carbon tax, would worsen the resource constraints. There seems then to be a natural case for compensation in the form of assistance for educational investment. Indeed, such assistance can be part of the "grand bargain" between rich and poor countries where the imperative of continued development for present generations is recognized at the same time as the imperative of mitigating climate change for future generations.

Putting together the poverty alleviation imperative and the key role of investment in education in achieving this, with the central role of countries like India in managing greenhouse emissions, suggests the contours of the global grand bargain which can meld together justice between the generations and justice within the present generation—justice in our time. But this needs education of the taxpaying publics of the rich countries, on the ethics of global redistribution, the science and ethics of climate change and climate justice, and of course on the role of education itself in achieving these goals.

Policy Conclusions

Climate justice requires sharing the burdens and benefits of climate change and its resolution equitably and fairly. It brings together justice between generations and justice within generations. In particular it requires that attempts to address justice between generations through various interventions designed to curb greenhouse emissions today, do not end up creating injustice in our time by hurting the presently poor and vulnerable. The spillover effects from addressing climate change to the wellbeing of present generations can in turn be addressed in principle if there a sufficient number and variety of policy instruments. The smaller the set of policy instruments, the more likely it is that injustice within the present generation cannot be avoided. This essay has considered the transformative role of education in its many dimensions as one entry point into expanding the scope of policy instruments available to policy makers.

The first use of education flows from the recent literature on behavioral economics. Education, at different levels and in different manifestations, which conveys full scientific information about the likely consequences of climate change, and which builds on the natural tendency in human beings to be aware of the collective good, can change individual demand and supply in the market place in a climate friendly direction as much as any conventional tax or subsidy scheme. Indeed, such shifts in demand and supply can be effective even when, for technical or political reasons, tax and subsidy schemes are not feasible. Such education can even help to overcome the traditional political opposition to carbon tax proposals in rich countries, as their populations

become more aware of the costs of climate change. The education can be of a conventional type, through the school and college curriculum, or more general and widespread, using new technology and social media. But the overall effect is bound to be beneficial by in effect creating new policy instruments to address the market failure that is climate change.

However, even with such use of education to enhance policy responses to the injustice between the generations, the issue of injustice within our generation is unlikely to disappear, far from it. Carbon taxes or bio-fuel subsidies, for example, will indeed have distributional consequences for our generation, and addressing this will require resource transfers within our generation to maintain and enhance the development potential of those negatively affected by interventions to mitigate climate change. Once again, education, in the form of development assistance for education in particular, comes to the fore. Continued assistance for education to the poor in Low and in Middle Income Countries, as part of a grand global bargain on climate change and development, is thus an invaluable instrument for climate justice.

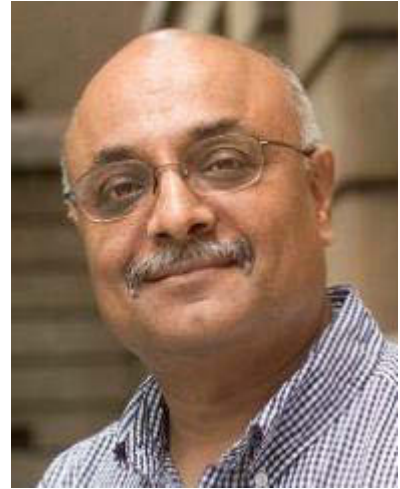
To conclude, education can change market place behavior, primarily in rich countries but also in poor countries, and thus help mitigate climate injustice between the generations; and resources targeted to education of the poorest can help their development but also help to counter some of the negative spillover effects of climate change mitigation interventions. Hence the title of this essay—Education for Climate Justice.

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Professor Ravi Kanbur is T. H. Lee Professor of World Affairs, International Professor of Applied Economics and Management and Professor of Economics at Cornell University. He holds a bachelor's degree in Economics from the University of Cambridge and a doctorate in Economics from the University of Oxford. He has taught at the Universities of Oxford, Cambridge, Essex, Warwick, Princeton and Columbia. He has served on the staff of the World Bank in a number of capacities and has also served as Director of the World Bank's World Development Report. He is the author of over 200 publications, covering topics such as risk taking, inequality, poverty, structural adjustment, debt, agriculture, and political economy.



Professor Kanbur is also a member of the High Level Advisory Committee (HLAC) to the Climate Justice Dialogue, an initiative of the Mary Robinson Foundation – Climate Justice and the World Resources Institute, which aims to mobilize political will and creative thinking to shape an ambitious and just international climate agreement in 2015.

In 2013, the members of the HLAC, which includes former presidents and other leaders from the fields of politics, science, business, civil society and academia, issued a [Declaration on Climate Justice](#).

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