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PERI's Shouvik Chakraborty and co-author Rohit Azad contribute a chapter to the *Handbook of Green Economics*

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Chapter Abstract

Climate change is a global problem, and a global problem needs a global solution. This study makes a case for a differential carbon tax across the globe to achieve a comprehensive green energy transition which requires, according to most estimates, 1.5% of each country's GDP. A just approach to achieve it would involve a global sharing of this solution among the advanced nations, which are also the major polluters, and the developing nations according to their respective shares in global emissions.

Unfortunately, a genuine consensus on the mitigation of climate change is missing between the North and the South. Our proposal, JET (a Just Energy Transition), requires countries contributing less than the average to mobilize a part of their resources through carbon taxes commensurate with their distance from the average and the deficit billed by countries with per capita emissions higher than the global average, who will consequentially have to mobilize more than their transition requirements.

Given that the level of global carbon emissions is currently at 36.1 billion metric tonnes of CO₂, we calculate the global carbon tax rate at \$46.1 per metric ton for the global energy transition. The total amount of 'carbon compensation' made by the 'payer' nations (polluting more than the average in per capita terms) comes to around USD 570 billion. In terms of 'compensated' countries, India comes at the top. We also calculate the effective carbon tax for each nation.

Climate change negotiations continue to deal with the sharing of the burden between the North and the South. Our proposal is not only a just way to balance the ongoing environmental and ecological damages, but it will also help the resource-poor countries to make the energy transition without having to worry about the finances unduly.

Currently, the increasing levels of emissions and the threat of climate change looming over humankind along with growing inequality across the globe, a differential global carbon tax based on each nation's emission levels to finance the global energy transition project can be a viable solution to address global inequality and climate change simultaneously.

Globalisation, climate change and distribution – towards an inclusive pro-poor climate policy

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in profound changes in the world economy which have farreaching implications for development. The distribution of benefits and costs of globalisation is unequal among the different countries of world. There are few winners and many losers. During the last three decades, there has been a divergence, rather than convergence, in levels of income between countries, within countries and between people. Globalisation is an uneven and socially unequal process which has increased the problem of inequality and exclusion. The question arises here that to what extent globalisation is instrumental in overcoming or alternatively aggravating the situations of inequality and exclusion

In this context, the paper writers can focus on the following sub-themes: Globalisation and Nations of South: Unequal Participation and Unequal Outcome Globalisation, Artificial Intelligence and Unemployment Globalisation, Informal labour, Gig Economy and Working Environment Globalisation and Exclusion: Inclusion of Few and Exclusion of Masses Globalisation and Inequality between countries, within countries and between people Globalisation, WTO and Agriculture Globalisation, Economic Growth and Employment Opportunities

PAPER SUBMISSION GUIDELINES The length of the paper should not exceed 15 pages including abstract, tables and figures (Font - New Times Roman, Font Size- 12 Point, Line Space- 1.5). Kindly use latest APA guidelines for paper writing. The language and spellings used should be British (U.K.). The papers will be reviewed by a panel of experts and selected papers will be published. Kindly submit your Paper via email and the authors are requested to communicate all queries regarding the papers to the Conference Convenor, Dr. Jasdeep Singh Toor (+91-9501000022) at: jasdeeptoor22@gmail.com

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Baum—Basic distributional issues of an ecosocialist (global) analysis

Josef Baum, University of Vienna

Exploitation of labour and the degradation (and exploitation) of nature have a common basis in the capitalist mode of production. Concrete distribution issues are underexposed in the climate policy discourse.- With pending needs and “dead lines” of climate change the social and ecological question has to be solved together within a relative short time – and on a global level. For this aim ecosocialist (global) analysis has to be developed deeper.

The following considerations are made on income basis because of lacking data on a class concept, but should be transformed into a class concept in ongoing research:

Basically “poverty” or “richness” make a difference in causation of ecological crisis and suffered environmental pressure. If lower income groups are relatively more disadvantaged by different forms of socioeconomic and socio-ecological inequality, these groups will experience an increase in the socio-ecological burden when climate change continues.

There are correlations between **causations** of environmental troubles and income along strata and class criteria (distribution and capitalist accumulation.

And there are correlations between **exposition** to environmental harm and income resp. class.

- E. g.: Harassment by traffic exhaust emission different for income and wealth
- Persons at risk of poverty evaluate their exposure to negative environmental effects in all fields (noise, air quality, green space...) worse to others

Four distribution dimensions are proposed: A Social-economic, Socio-ecological, Spatial, Temporal or Intergenerational dimension.

The socio-ecological distributional dimension is divided into nine levels:

1. (Real) access and use of "nature services" – e.g. green space during heat waves
2. Imposition by environmental degradation - Impact by 3 sub-levels
 - a. exposition
 - b. Sensitivity (alternatives!)
 - c. Actual effects
3. Risk and uncertainty by future environmental pollution - For example, floods, landslides, storms, heat stress, accident hazards
4. Causing environmental degradation - Current and historical.
5. Cost bearing -burden sharing
 - Direct and indirect. Overlapping possibilities, incidence of environmental measures. E.g. CO2 tax
6. Possibilities to influence environmental policy measures. Real participation

7. Positive impact of environmental policies, benefits from positive changes in the environmental situation
8. Co-benefits: positive indirect impacts of environmental policies e.g. Air quality improvement by climate policy
9. Adaptation effects to positive changes in the environmental situation – e.g. due to the rise in land prices

Now from nine levels of socio-ecological distribution listed here, **seven from the empirical literature tend to be asymmetrically structured in favor of upper income strata (pro-rich-effects)** in the distributional analysis. Only levels Nr 6 and 7 - the "positive impact of environmental policies" and the "impact of co-benefits" - show a reverse trend (pro-poor)

On the other side the overall impacts of effective climate policy are basically pro-poor (e.g. by better public transport). And lower income groups will earn more gains by effective climate policy, especially when at the costs of environmental measures (e. g. by taxes) the pro-rich effects can be mitigated, eliminated or reversed by a **per capita bonus** or other compensations.

The implementation is most difficult on a global level.

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Why Climate policy is pro-poor - Nine Levels of socio-ecological justice

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Abstract

*Masses of young people have gained an enormous momentum in demanding **Climate Justice**. The debate on environmental justice, has been conducted for almost 40 years, beginning in the USA. In the discourse of climate change **concrete** distribution issues basically have been underexposed. Anyway unfairly experienced climate policy can be a barrier for acceptance - see the "yellow vests" in France which at their beginning opposed also a carbon tax.*

*There is a special complexity by linking four basic distribution dimensions: Social-economic, socio-ecological, spatial (regional), temporal (or intergenerational) dimension. The socio-ecological dimension of distribution - focused here - can be divided again into nine levels: (Real) access and use of "nature services", vulnerability, risk, causation, burden sharing, influencing environmental policy, impacts of environmental policies, co-benefits, adaptation effects to positive changes. **Seven levels from literature tend to be asymmetrically structured***

in favour of upper income strata, they have “pro-rich”-effects in the distributional analysis. Only the level of impacts of environmental policies and co-benefits tends to be “pro-poor”. The conclusion: Without any countermeasures, basically climate change and environmental degradation will significantly increase pro-rich effects. Conversely, the overall impacts of effective climate and environmental policy are basically pro-poor. And a more general conclusion: climate and environmental policy objectively is not a luxury issue of middle and upper classes but a substantial issue of lower classes

Deduced from science at least since thirty years the social and economic implications of climate change can be considered as existential threats for mankind. Since then only the probabilities of consequences of undamped climate change have been augmented steadily. And absolutely worryingly since then the paths of the worst case prognosis materialized until now.

But in Europe as well as in other regions the fundamental topic for the future of mankind has not been tackled seriously and effectively by politics. But recently there is basic change: the experience of hot summers and other events – and we are still in the first stages of climate change - definitely minted the consciousness of significant parts of the population in the sense that there is an immediate need for acting – and acting massively in all fields and together with other regions of the world. Interestingly this has led to a situation that for the first time elections are determined significantly by the topics raised by climate change, so in Austria in September 2019, and formerly in Germany.

From Anthropocene to Ecological Civilization

Climate change is the most urgent but not the only one fundamental environmental question mankind is facing. For example, the extinction of species and the loss of ecosystems is another essential matter of urgency that is connected with climate change. Whereas checking climate change is a tremendous problem, it is somehow “simpler” than protecting biodiversity because climate change can be curtailed by transforming the energy system towards renewable energy; but protecting biodiversity and invaluable assets is even much more complex, because even much more fields – and not “only” energy have to be transformed. – On the other hand the fixing of the ozone hole has been partly successful because this was achievable by putting comparably unimportant chemical substances out of action, and the relative success unfortunately has fed the believe in simple technological solutions.

The concepts of "Planetary Boundaries" and the “Anthropocene” (maybe the notion of “Capitalocene” is more distinct) reflect the interconnections of many severe environmental global problems. On the other side a frame for a human survival in dignity and a paradigm shift to an “Ecological Civilization” emerges also on the horizon - a notion remarkedly created in China¹, where environmental problems concentrated by a time compressed development along “European” industrial paths in densely populated areas in East China - , and we are also in the first stages of this paradigm shift. But obviously anyway there will be still a long march with hardly conceivable challenges.

Interestingly the notion “ecological civilization” recently is used sometimes by scholars and writers in Europe whereas it is not clear whether they are aware of the origin of this notion. Similar approaches with more or less the same substance can be identified in various regions even though other notions or labels are used. E. g. in Latin America the concepts on “buen

¹ Adopted at the 17th party congress of CPC in 2007

vivir” can be seen akin whereas the respective origin and background is rooted in the history of indigenous people.

Anyway sciences can and shall give analysis, directions and perspectives for the socio-ecological transformation to an ecological civilization. And one field is the of economics of distribution:

One of the most heard slogans of the young people of “Fridays For future” (FFF) is: **What do want: Climate Justice.** - What does this mean concretely? A basic question in this respect is which social groups are particularly affected by bad environmental conditions. Unequal living conditions, in addition to the distribution of income and wealth, also implicate unequal access to other resources or the fact that different groups of people are exposed to certain burdens. **Environmental justice** has been developed as a concept for almost 40 years, especially in the USA; in Europe it was used later e. g. in the German-speaking world significant respective discourses started about two decades ago.

Distribution issues are sometimes mentioned generally in the climate policy literature, but hardly in the whole, and rarely exactly. In climate policy and also in political science the category of fairness – let alone the definition – generally is seen as useful for reducing barriers to climate change policy implementation, but the meaning of it often is not only different but often oppositional due to conflicting interests. And so - additionally and complementary to lacking actual intentions - concrete distribution issues are underexposed in the climate policy and environmental discourse- at least at the national level, while there has been more literature on the global level of distributional effects between countries.

Four basic distributional dimensions

In a recent – still unpublished – (meta)study² of some dozens studies of the relevant literature on socially differentiated impacts of climate change socio-ecological effects of environmental degradation were put in a systematic distribution perspective. The main findings on socially differentiated impacts of climate change were:

There is a special complexity by linking four basic distribution dimensions:

1. Social-economic dimension ("classical" income distribution)
2. Socio-ecological dimension
3. Spatial (regional) dimension: especially place of residence and workplace
4. Temporal or intergenerational dimension

Here the socio-ecological dimension will be focussed further: this dimension can be divided again into nine levels, whereby the current distribution asymmetry and the relation to space and time can be indicated; "Pro-rich" or "pro-poor" are categories used often in the evaluation of measures of distribution policy.

Nine Levels of socio-ecological justice

1. (Real) **access and use of "nature services"** – e.g. green space during heat waves

² Josef Baum: Zu Fragen der Verteilungswirkungen in der Klimapolitik. Studie im Auftrag der Kammer für Arbeiter und Angestellte für Wien (Josef Baum - On issues of distributional effects in climate policy. Study - On behalf of the Chamber of Labour, Vienna)

2. **Vulnerability** of damage and imposition by environmental degradation
3. **Risk and uncertainty** by future environmental pollution
4. **Causation** of environmental degradation
5. **Burden sharing** - bearing of costs of environmental policy
6. Possibilities of **influencing environmental policy measures**
7. **Positive impact of environmental policies**
8. **Co-benefits**: positive **indirect** impacts of environmental policies
9. **Adaptation effects to positive changes** in the environmental situation

More in details:

1. (Real) **access and use of "nature services"**

(Real) access to meet basic needs: water (quantity and quality), clean air, energy availability; access to healthy food, landscape, green and recreational areas (green space, for example, as a cooling factor in heat waves) etc. Also access to information (e. g. weather warnings).

- In the socio-economic dimension this corresponds to access to public transport infrastructure, education and health infrastructure and other infrastructure and housing

2. The **Vulnerability** of damage and environmental degradation

The concrete incidence of damage and imposition by environmental degradation on different groups is realized by an interaction of some factors: Real exposure, and concrete sensitivity (susceptibility). Options to evade harm (possible availability of alternatives) are heavily dependent on social status. The actual incidence can be measured, for example, by health indicators.

Multiple exposures usually mean a multiplication of risk – also possible effects of climate change (heat, dangers to health, etc.). Exposure to an unhealthy environment at the workplace has a long historical tradition. There a large part of the lifetime is spent.

3. **Risk and uncertainty** by future environmental pollution

Exposure can be understood not only by immediate concern but also in a **potential future concern** by risks. This is particularly relevant to climate change, because this is about the possible future impact of extreme weather events and their consequences, including floods, landslides, storms, heat stress water problems and so on.

4. **Causation** of environmental degradation - Current and historical

Emissions to the air, water and soil, noise have caused permanent or irreversible damage. And there is socially differentiated causation. However, in complex systems where there are many connections and feedbacks, the question of whether there are clear causes is not trivial.

Firstly it has to be determined whether a state or its territory is used as a spatial definition, or whether global value chains are to be considered.

One analytical answer given is that the supposedly autonomous consumer decisions control the system; a simple application of “polluter-pays” principle to reduce in this sense environmental damage probably would not only affect minorities but majorities of the population in the industrialized countries.

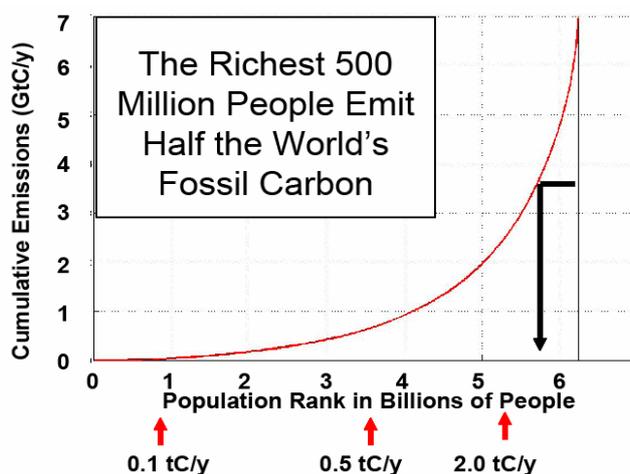
Another analytical option is the dynamics of accumulation of capital with continuous profit-making as the driving force.

A specific illustrative option is to attribute the greenhouse gas content of physical capital, material infrastructure and consumer durables to persons or households.

Even more complicated – it is also about current **and** historical (cumulative) causes. In the case of greenhouse gases historical accumulation is specifically important, because CO₂ remains in the air more than hundred years. - However, the (historical) causation is particularly complex with regard to climate change. Overall data or operational concepts regarding identical legal entities, continuity of families, households, companies and capital, or the allocation of infrastructure usage are currently barely available. But there is some luck: current income data have some useful correlations with historical causation, and so the “polluter-pays” principle could be implemented approximately with some adaptations.

- The distribution of climate-relevant emissions on a personal framework on all spatial levels level is extremely concentrated: in the following evidence³ on the global level⁴:

Global inequality of climate-relevant emissions at the personal level - Socially differentiated causation



- Of course it would be more convenient if it would be possible to have data along classes in a Marxian sense. But income and wealth data can be seen as some substitute.

5. **Burden sharing:** Bearing of costs of environmental policy - and possibilities to transfer costs.

When it comes to paying the bill for environmental measures, the socio-economic dimension is closely linked to the socio-ecological dimension. It is about direct **and** indirect effects, about bearing the costs of environmental policy, and at last about the incidence of environmental

³ Pacala S.W.: Equitable Solutions to Greenhouse Warming: On the Distribution of Wealth, Emissions and Responsibility Within and Between Nations. Princeton, at IIASA, November 2007
<http://www.iiasa.ac.at/iiasa35/docs/speakers/speech/ppts/pacala.pdf>

⁴ With an old number of the total global population but still valid in a distributional view

measures, and possibilities to shift costs to others: How the burden is shared. - EU-speech changed “burden sharing” to “effort sharing” but this does not matter.

Typical issues are the effects of environmental taxes like carbon taxes. Although ultimately dependent on the specific design of a tax, the literature on the evaluation of distribution of costs of environmental policies without special compensatory elements since long has been consistent to be "regressive", or pro-rich.

If a "common load principle" instead of a polluter-pays principle is applied, which can be used when polluters can not be identified, the distributional effects correspond to the incidence of the general tax system.

A feasible positive approach is not to create a new tax but to reform the tax system offering a frame system that rewards environmentally friendly behavior; or to give back (parts of) the tax on an equal per-capita basis (“eco-bonus”) what will trigger a redistribution to poorer people.

6. Possibilities of **influencing environmental policy measures**. Real participation

The real influence on or participation in decisions is usually higher for groups with higher incomes and assets. - A positive alternative perspective would be the extension of real participation possibilities in decisions

7. **Positive impacts of environmental policies**, benefits from positive changes of the environmental situation

This is the core of the reasoning of the basic question on the (re)distribution of benefits through positive changes in the environmental situation caused by public environmental policies.

A broader literature has seen a fundamentally positive direction of environmental policies since the 1970s (!), with the following reasoning⁵: "As lower income groups have fewer opportunities to escape the effects of environmental pollution than high-income individuals, there can be basically a redistributive effect of spending to eliminate these negative externalities."⁶

Environmental measures generally will finally increase the health and thus the expected lifetime income of socially disadvantaged.

8. **Co-benefits**: positive **indirect** impacts of environmental policies

Because socioeconomic inequality, which can be operationally tied to income or wealth, is broadened and consolidated by parallel socioecological inequality at several levels, and thus an accumulation effect is at work, there is some evidence that adversary effects act by effective environmental policies producing “co-benefits” and so reverse former distributional effects of pollution. So clearly, pro-poor effects can be observed.

An example: e. g. using renewable energy implicates air quality improvement, and so also positive effects on health; by less road traffic cities become livelier.

9. **Adaptation effects to positive changes** in the environmental situation – e.g. due to the rise in land prices

⁵ The author is the later director of the Austrian Central Bank

⁶ Nowotny Ewald (1974): Wirtschaftspolitik und Umweltschutz P. 273 (translated)

Positive changes in the environmental situation can, for example, lead to an increase in land and housing prices and thus indirectly also have negative effects for low-income layers, and more generally trigger gentrification effects

Climate policy is pro-poor

The result of the literature overview on the socio-ecological distribution of impacts on these nine levels is:

Seven levels from literature tend to be asymmetrically structured in favor of upper income strata, they have **pro-rich-effects** in the distributional analysis. Only level 6 and 7 - the positive impact of environmental and climate policies and co-benefits show a reverse trend (Pro-poor). Concretely: when lower income groups are relatively more disadvantaged by different forms of socioeconomic inequality, the increasing effects of climate change on these groups increase the asymmetry of socio-ecological pressures. So these groups will experience an increase in the socio-ecological burden when climate change and ecological degradation continues.

The important **conclusion** – very **relevant for left politics**: Without any countermeasures, basically climate change will significantly increase pro-rich effects at seven levels.

Conversely, the overall impacts of effective climate and environmental policy are basically pro-poor, and can be augmented by specific (tax) structures, especially when at the cost side of environmental measures (e. g. by taxes) the pro-rich effects can be mitigated, eliminated or reversed by a per capita bonus or other compensations.

And climate protection measures will basically increase the pro-poor effects over time, and so do most measures leading to an improvement of the quality of the environment.

And a more general conclusion: climate and environmental policy objectively is not a luxury issue of middle and upper classes but a substantial issue of lower classes

Open Questions and perspectives

Because the solution of the climate question can ultimately only be global, the connection of national and global distribution issues, which has hardly been discussed so far, is important and should be analysed comprehensively by combining a real view of the large global disparities and the necessity to implement climate policy measures.

It cannot be ignored that "power" can shift social and environmental costs to the general public, or specific social groups, specific nations and future generations. And it should also be raised the question of who has the power of interpreting and simplifying complexity in his own interests.

Essentially seems to be the understanding that the exploitation of labor and the degradation (and exploitation) of nature are not separate processes or problems but have a common basis in the global capitalist mode of production or from the effects of the accumulation of capital. Thus, there is a close relationship between the process of capitalist accumulation and distributional issues on the one hand, and the negative evolution of ecosystems on the other hand.

The dynamics of self-valorisation of capital with the pressure for on-going self-delimitation into social and environmental areas and thus for the "externalization" of "costs" are essential

keys for understanding the drivers of current social-ecological development, and the need for limitation and regulations, and a transformation to an Ecological Civilization

Here it is proposed to build up theories of transformation on two axioms that are not or only vaguely grounded in science: first, the comprehensive survival of humanity, and secondly, the same dignity of all people which can also be called "equal human rights".

By Hope from TINA to TAMARA

Unfairly experienced climate policy can be a barrier for acceptance (see the “yellow vests” in France which opposed a carbon tax at the beginning). On the other side anyway: Social inclusive measures that propose fairness, justice and equality can be viewed as preconditions for effective environmental and climate policy.

And the anchoring of the co-benefits of climate policy measures (better air, better public transport, more green space in cities, less road noise and much more) in public opinion as a "multiple dividend" is important for the acceptance of the necessary far-reaching climate policy and environmental measures. - Co-benefits can represent a significant reduction of inequality in socioecological terms.

Because climate change is a complex process, integrated solutions are necessary. Single measures can even increase blockages. The real world ultimately requires package solutions. It needs comprehensive solutions, it needs great solutions.

So a positive **coefficient of hope** for change to sustain livelihood in relation to paralyzing **fear** can reflect the dynamics of development towards an Ecological Civilization:

Practically we have to fight the hegemony of TINA (**T**here **I**s **N**o **A**lternative – to neoliberal policy) and replace it by TAMARA (**T**here **a**re **m**any **a**nd **r**eal **a**lternatives).