

# EXTREME CARBON INEQUALITY

Why the Paris climate deal must put the poorest, lowest emitting and most vulnerable people first

## SUMMARY

Climate change is inextricably linked to economic inequality: it is a crisis that is driven by the greenhouse gas emissions of the 'haves' that hits the 'have-nots' the hardest. In this briefing Oxfam demonstrates the extent of global carbon inequality by estimating and comparing the lifestyle consumption emissions of rich and poor citizens in different countries.

Strikingly, our estimates of the scale of this inequality suggest that the poorest half of the global population – around 3.5 billion people – are responsible for only around 10% of total global emissions attributed to individual consumption,<sup>1</sup> yet live overwhelmingly in the countries most vulnerable to climate change.

Around 50% of these emissions meanwhile can be attributed to the richest 10% of people around the world, who have average carbon footprints 11 times as high as the poorest half of the population, and 60 times as high as the poorest 10%. The average footprint of the richest 1% of people globally could be 175 times that of the poorest 10%.

While COP21 in Paris will see a deal negotiated between governments on the basis of the total emissions produced in their territories, the real winners and losers will be their citizens. The litmus test of the deal will be whether it delivers something for the poorest people who are both the least responsible for and the most vulnerable to climate change, wherever they live.

Oxfam's new data analysis, which attributes estimated total lifestyle consumption emissions for different countries to the varying income groups within them (see Box 1 for definitions and methodology), not only shows the extreme nature of global carbon inequality, but also helps bust some of the myths that have circulated around the UN climate talks for years about who is driving climate change.

*The poorest half of the global population are responsible for only around 10% of global emissions yet live overwhelmingly in the countries most vulnerable to climate change – while the richest 10% of people in the world are responsible for around 50% of global emissions.*

*The average footprint of someone in the richest 1% could be 175 times that of someone in the poorest 10%.*

Comparing the average lifestyle consumption footprints of richer and poorer citizens in a range of countries helps show that while some 'emerging economies' like China, India, Brazil and South Africa have high and rapidly rising emissions, the lifestyle consumption emissions of even their richest citizens remain some way behind that of their counterparts in rich OECD countries, even though this is changing and will continue to do so without urgent climate action. The lifestyle emissions of the hundreds of millions of their poorest citizens, meanwhile, remain significantly lower than even the poorest people in the OECD countries.

While the richest citizens can and should contribute as individuals to cutting their own emissions through lifestyle changes, wherever they live, they cannot solve the climate crisis through voluntary action alone. Their choices are often constrained by the decisions of their governments in all sorts of areas, from energy to transport policy. Without question, a weak agreement in Paris is no more in their interests than it is in the interests of the poorest and least responsible. Increasingly members of the richest 10% are experiencing the impacts of climate change themselves, and are mobilizing to demand action from their governments.

The only beneficiaries of inadequate climate action in Paris and beyond are a much smaller elite with vested interests in the continuation of a high carbon and deeply unequal global economy. Between the Copenhagen and Paris climate conferences, the number of billionaires on the Forbes list with interests in fossil fuel activities has risen from 54 in 2010 to 88 in 2015, while the size of their combined personal fortunes has expanded by around 50% from over \$200bn to more than \$300bn.<sup>2</sup> Governments in Paris need to stand up to their influence, and stand up for their citizens – the poorest, lowest emitting and most vulnerable among them first and foremost – if Paris is to deliver an agreement for those who need it most.

*Between the Copenhagen and Paris climate conferences, the number of billionaires with interests in fossil fuel activities has risen from 54 in 2010 to 88 in 2015. Their combined personal fortunes have expanded by around 50% from over \$200bn to more than \$300bn.*

## Endorsements for 'Extreme Carbon Inequality'

*'We see Oxfam's report and our recent paper "Carbon and inequality: from Kyoto to Paris" as two halves of the same walnut. The two studies converge towards one key fact: individual carbon emissions are highly unequally distributed throughout the world. Oxfam claims that any successful agreement at the Paris COP should take into account within-country carbon inequalities – and climate change impacts. We could not agree more. Our proposal to progressively tax carbon emissions in order to finance climate adaptation and Oxfam's call to secure a low-carbon developing space for the world's have-nots are highly complementary.'*

**Lucas Chancel and Thomas Piketty**

Co-authors, 'Carbon and inequality from Kyoto to Paris,' Paris School of Economics

*'This timely report from Oxfam leaves no doubt that the test of an effective and climate just deal from Paris is the extent to which it protects the poorest and most vulnerable people in the world. They are after all least responsible for and the most vulnerable to the impacts of climate change. The report shows that women bear the heaviest burden in a warming world; they are particularly at risk due to gender inequalities, a reliance on climate sensitive livelihoods and a lack of assets to fall back on in harsh times. The recommendations of the report for the Paris Agreement, targeting increased finance for adaptation, attention to human rights and gender equality and the need to phase out fossil fuels while phasing in access to sustainable energy for all, are the measures against which to evaluate success.'*

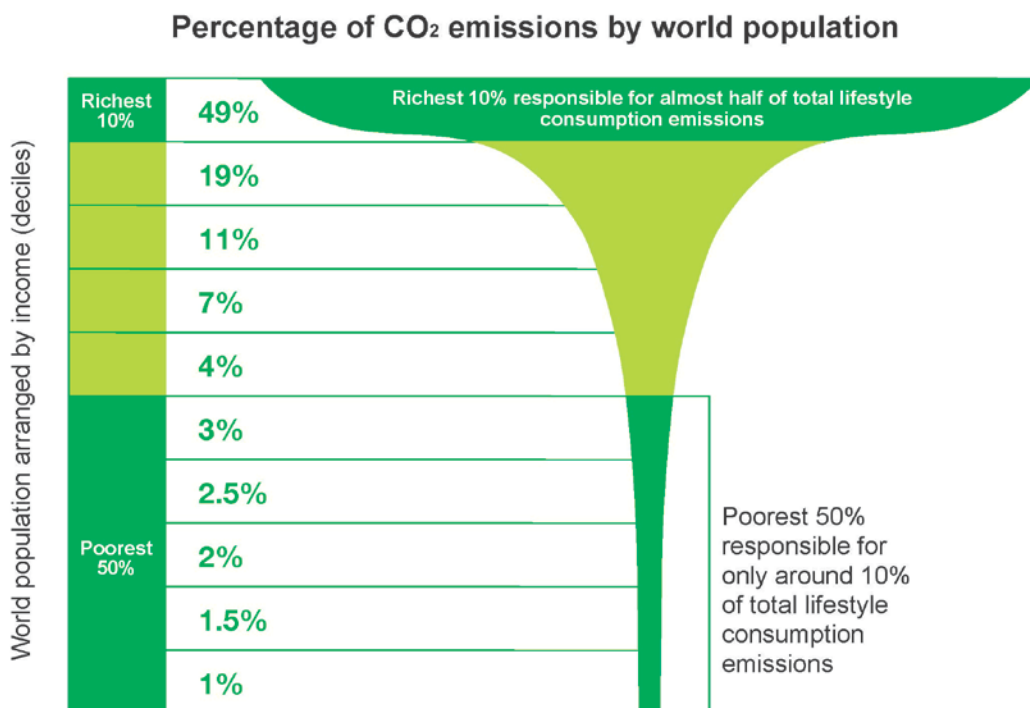
**Mary Robinson** President, Mary Robinson Foundation – Climate Justice

# 1 Climate change and economic inequality are inextricably linked

Paris is a deal between governments, but the real winners and losers will be their citizens. In this briefing Oxfam uses new data analysis to estimate and compare the lifestyle consumption emissions of citizens of different countries, in order to demonstrate the scale of carbon inequality both globally and within key countries.

Those with most at stake in Paris are the poorest 3.5 billion people on the planet, responsible for only around 10% of the total emissions from individual consumption, yet living overwhelmingly in the countries most vulnerable to climate change. In the dataset used to generate these estimates, individual consumption is responsible for 64% of global emissions, with the remaining 36% attributed to consumption by governments, investments (e.g. in infrastructure) and international transport. However, a recent paper by Chancel and Piketty finds very similar results attributing all national consumption emissions to individuals,<sup>3</sup> suggesting that our approach is a good proxy for attributing the shares of total global emissions. Figure 1 shows the distribution of global income from the richest to poorest 10% of people globally, and Oxfam’s estimate of their associated lifestyle consumption emissions as a share of the global total.

**Figure 1: Global income deciles and associated lifestyle consumption emissions**



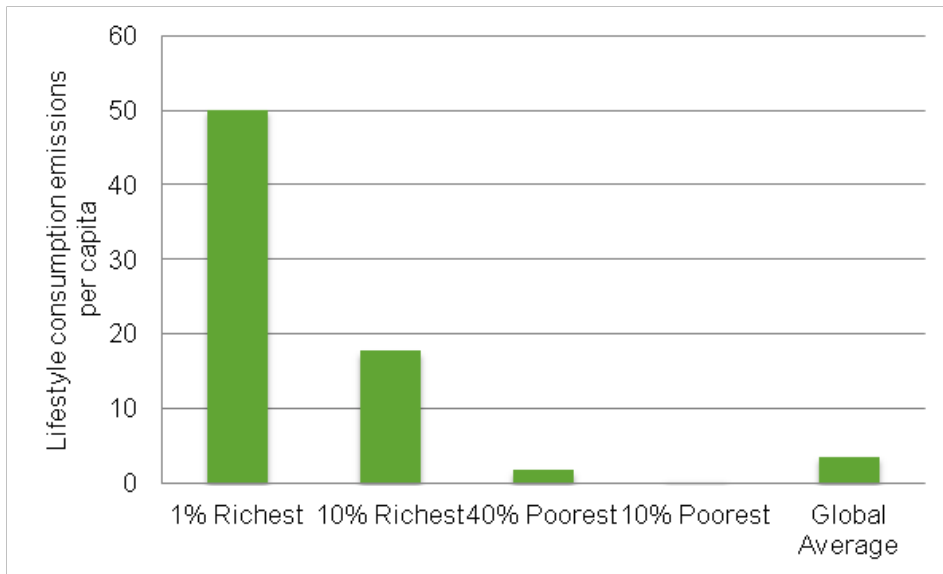
Source: Oxfam

We conservatively estimate that the average emissions of a person in the poorest half of the global population are just 1.57 tCO<sub>2</sub> – that equals 11 times less than the average footprint of someone in the richest 10%.<sup>4</sup> The average emissions of someone in the poorest 10% of the global population is 60 times less than that of someone in the richest 10%.

While estimates at the extreme top and bottom of the global income distribution are more difficult to make, there is no question the gap is much wider still: the richest 1% may emit 30 times more than the poorest 50%, and 175 times more than the poorest 10%<sup>5</sup> (see Figure 2).

*The average emissions of someone in the poorest 10% of the world population is 60 times less than that of someone in the richest 10%.*

**Figure 2: Lifestyle consumption emissions per capita from different global income levels<sup>6</sup>**

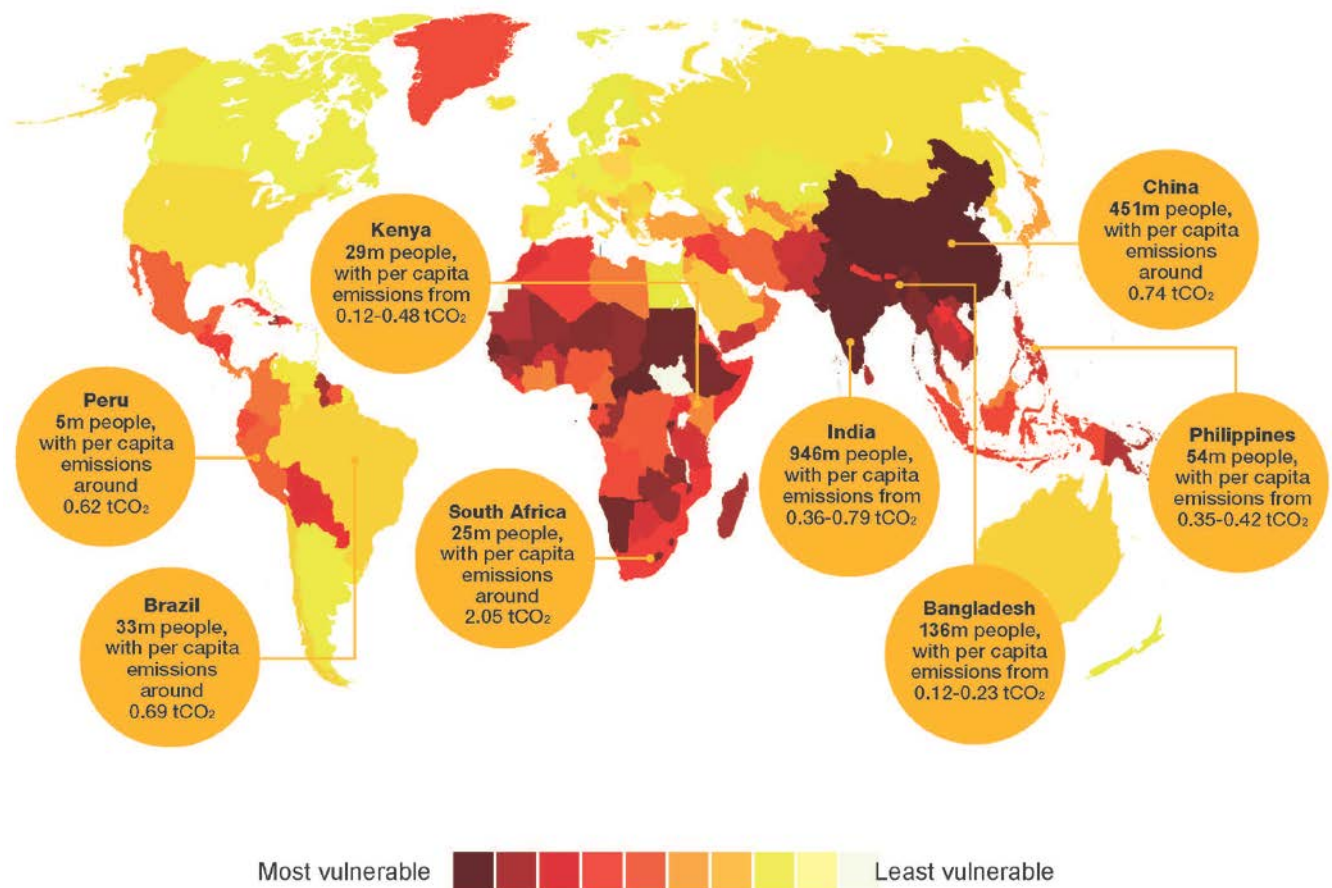


Source: Oxfam

*A recent World Bank study found that in the 52 countries analysed, most people live in countries where poor people are more exposed to droughts, floods and heat waves than the average of the population as a whole.*

What is more, the poorest half of people on the planet live overwhelmingly in countries that are considered the most vulnerable to climate change.

**Figure 3: Examples of where in the world people in the poorest half of global population live, and the scale of their lifestyle consumption emissions footprints<sup>7</sup>**



Source: Oxfam; Centre for Global Development Climate Change Vulnerability Index

### Box 1: Inequality of impact and preparedness

The poorest people on the planet are not only least responsible for causing climate change, they also tend to be the most vulnerable to its consequences and least prepared to cope. But such inequalities are horizontal as well as vertical – with women facing greater risks than men, rural communities often more exposed than urban ones and groups marginalized because of race, ethnicity or other factors likely to be disproportionately affected.

A recent study by the World Bank found that in the 52 countries analysed, most people live in countries where poor people (defined as the poorest 20% of the national population) are more exposed to disasters like droughts, floods and heat waves than the average of the population as a whole – and significantly so in many countries in Africa and South East Asia.<sup>8</sup>

Women often bear the heaviest burden of all in a warming world.<sup>9</sup> They are generally more heavily dependent on climate-sensitive livelihoods (such as rain-fed agriculture, and collecting water for household use), and they often have the least to fall back on in harsh times or to help them escape a downward spiral in productivity (such as access to land, training or capital).

Such inequalities can be seen in rich countries too. The poorest residents in the Gulf states of the USA – Louisiana, Mississippi and Alabama – are exposed to a disproportionate threat from coastal flooding as a result of rising sea levels.<sup>10</sup> When Superstorm Sandy hit New York in 2012, 33% of individuals in the storm surge area lived in government-assisted housing, with half of the 40,000 public housing residents of the city displaced.<sup>11</sup>

Not only are richer countries and the richer communities within them less affected by climate change, they also tend to be far better prepared to cope with it.<sup>12</sup> In California, USA, irrigation covers over 80% of arable land, while in Niger, Burkina Faso and Chad it is less than 1%. While 91% of farmers in the US have crop insurance to cover losses in the event of extreme weather, only 15% of farmers in India are covered, 10% in China and just 1% or less in Malawi and most low-income countries.

*Women bear the heaviest burden in a warming world, generally more heavily dependent on climate-sensitive livelihoods and with least to fall back on in harsh times.*

What is clear is that climate change and economic inequality are inextricably linked. It is a crisis driven by the 'haves', which hits the 'have-nots' the hardest. If there is to be any justice in the deal in Paris, governments must deliver something for the have-nots, wherever they live.

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## Box 2: Estimating the distribution of lifestyle consumption emissions

A technical summary of the methodology behind the estimates presented in this briefing is available at <http://oxf.am/Ze4e>. The approach adopted assumes an elastic relationship between income and emissions. Put simply, it takes data on income shares of different percentiles at the national level and distributes aggregate national emissions to those percentiles.

It draws on two datasets: national income distribution data from analysis by Branko Milanovic based on household surveys for 118 countries in the benchmark year 2008; and estimates of CO<sub>2</sub> emissions associated with household consumption (which we here term 'lifestyle consumption emissions') from Glen Peters based on a Multi-Regional Input-Output (MRIO) trade model, covering 121 countries, for the year 2007.

Critically, the CO<sub>2</sub> model represents emissions from consumption rather than production. The underlying trade model allocates emissions associated with goods/services to the territory in which consumption takes place rather than the country in which the production occurs. This gives a more realistic picture of the actual emissions of citizens of different levels of income within a country. Emissions associated with consumption by governments, capital and international transport are therefore excluded. The proportion of total consumption emissions attributed to the lifestyle consumption of individuals varies by country, but globally accounts for around 64% of the total.

Oxfam's estimates should only be considered indicative of the orders of magnitude, but also as conservative, for two reasons. Firstly a significant number of mostly low-income countries are missing from the datasets; if they were included it would lower the average per capita emissions of the bottom 50% poorest people, and lower the share of the global total attributed to the bottom 50%. Secondly, we have assumed a nationally determined threshold of minimum emissions, raising the lower end of the distributions that may otherwise produce emissions values lower than might be considered plausible. See the technical note for a description of the approach taken and rationale.

Clearly there will have been some changes to the income and associated emissions distributions since the benchmark year for the data of 2008; however the orders of magnitude presented here – notably the difference between the richest and poorest people globally – are likely still to hold. There will likely be a smaller but still very significant share of the global poorest 40% in some middle-income countries like China and Brazil, where growth has been fastest and relatively more inclusive, and a growing representation of some middle-income countries in the global richest 10% (see section 2).



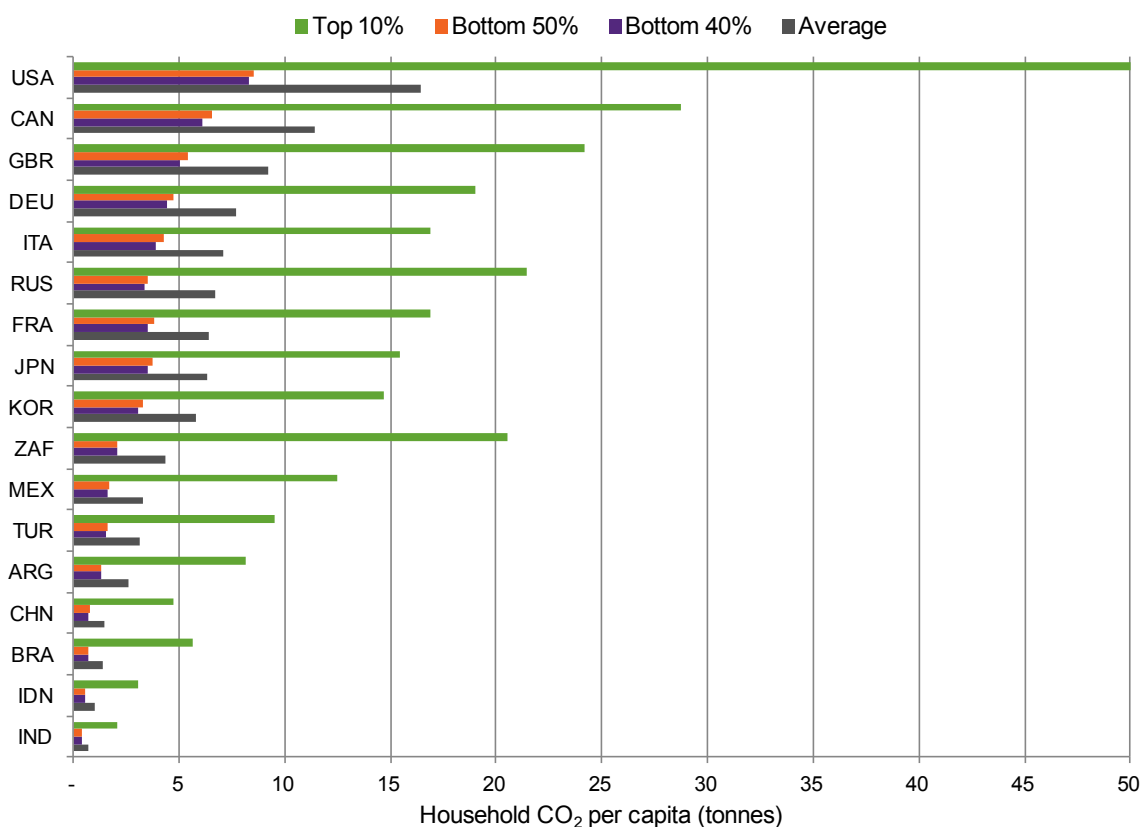
## 2 Lifestyle consumption emissions are highly unequal within and between countries

These new estimates can also help to dispel some of the myths that have long circulated around the UN climate change talks about who is responsible for driving climate change.

For years, developed countries have claimed they won't go beyond incremental targets to cut their emissions unless and until rapidly growing developing countries step up to cut their emissions too.<sup>13</sup> While it is absolutely critical to any chance of averting the most dangerous impacts of climate change that all developing countries play their part too, it is worth remembering that the lifestyle consumption emissions of citizens of even the developing countries in the G20 are far lower than those of their counterparts in the rich OECD countries, and that there are significant differences in the consumption footprints of rich and poor citizens among those countries too. That is, it makes little sense to treat them as though they are a single bloc (see Figure 4).

*The lifestyle consumption emissions of citizens of even the developing countries in the G20 are far lower than those of their counterparts in the rich OECD countries.*

**Figure 4: Per capita lifestyle consumption emissions in G20 countries for which data is available**



The majority of the world's richest 10% high emitters still live in OECD countries; around a third are from the US. While the total emissions produced in China divided on a per capita basis have now surpassed those of the European Union,<sup>14</sup> the per capita lifestyle consumption emissions of even the richest 10% of Chinese citizens are still likely to be considerably lower than the richest of their OECD counterparts.<sup>15</sup> This is because such a large share of China's emissions is from the production of goods consumed in rich countries.

*The vast majority of the world's richest 10% high emitters still live in rich OECD countries, although that is slowly changing.*

As recently as 2008 (when the latest publically available data used in these estimates was produced) the average emissions of a person in the richest 10% of Chinese citizens was about the same as the average carbon footprint of someone in the poorest 40% of Europeans. Even allowing for the rapid growth in the size of China's economy since then, this is unlikely to have changed dramatically yet, given the sheer scale of the Chinese population.

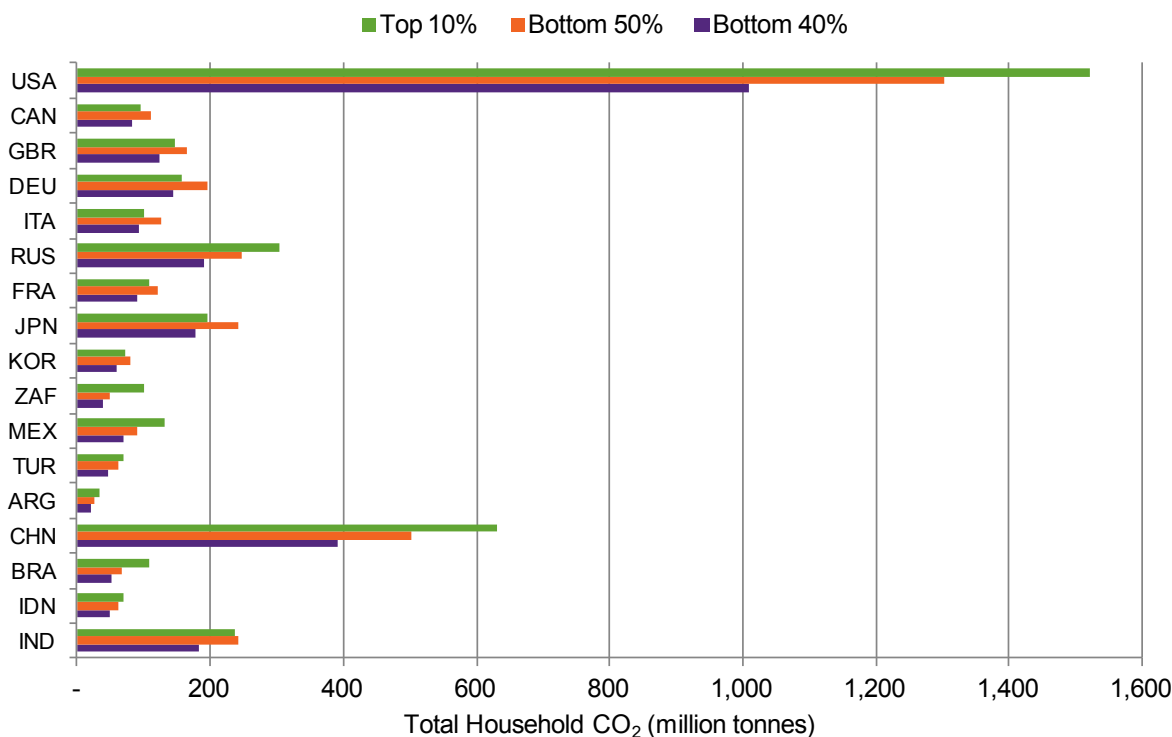
With regard to India the differences are even starker. Oxfam's estimates suggest that even the richest 10% of Indian citizens have per capita emissions just one-quarter of the poorest 50% of those from the US, while the poorest 50% of Indians have a carbon footprint that is just one-twentieth of the poorest 50% in the US.

Even in absolute terms, the sheer scale of the gap between the responsibilities of the richest compared with the poorest is compelling (see Figure 3). While the huge populations of countries like China and India clearly contribute significantly to the global total of emissions from lifestyle consumption – again reinforcing the need for strong climate action in those countries – the poorest half of the Chinese population (over 600m people) have a total emissions footprint that is still only one-third that of the richest 10% of US citizens (around 30m people). The poorest half of the Indian population (around 600m people) emits only half as much again, about the same as the richest 10% of people in Japan (around 12m people).

*The average emissions of the richest 10% of Indians is just one-quarter of the poorest half of the US population, while average emissions of the poorest half of the Indian population is just one-twentieth that of even the poorest half of the population in the US.*

*The poorest half of the Chinese population (over 600m people) have a total emissions footprint that is only one-third that of the richest 10% of US citizens (around 30m people).*

**Figure 5: Total lifestyle consumption emissions in G20 countries for which data is available**



However what is also clear from the data in Figure 2 is that rapidly growing 'emerging' economies like China, India, Brazil and South Africa, while showing significant diversity in the income and emissions distributions of their populations, all have highly unequal economies with correspondingly highly unequal emissions footprints between their citizens.<sup>16</sup>

The gap between the richest 10% and poorest half of the population is greater in South Africa and Brazil than in any other country in the G20. In South Africa, the richest 10% of citizens already have per capita lifestyle consumption footprints ten times that of the poorest half of the population. In Brazil, one of the few G20 countries to actually start to reduce shockingly high levels of inequality in recent years,<sup>17</sup> their footprint is eight times as high.

The estimates presented here are based on the latest publically available datasets from around 2007/8, and in the period since then both the income and emissions of the richest citizens in these countries will have increased (although the sheer scale of the populations of countries like China and India means the orders of magnitude are unlikely to have shifted dramatically yet). Without ambitious action to tackle inequality and drive down emissions in these countries, not only will it be increasingly difficult to eliminate extreme poverty<sup>18</sup> but also impossible to limit global warming below the 1.5C threshold that more than 100 countries have called for.

### 3 Vested interests in a high carbon and deeply unequal global economy are holding us back

While the richest citizens can and should contribute as individuals to cutting their own emissions through lifestyle changes, wherever they live, it would be wrong to conclude that they are solely responsible for solving the climate crisis, not least because their choices are often constrained by the decisions of their governments and the market forces they shape. Equally it would be wrong to conclude that a weak agreement in Paris is remotely in their interests.

Superstorm Sandy, Hurricane Katrina, the US droughts of 2010 and 2012, the on-going California drought: these are events that are directly impacting the lives and bank balances of the richest group of citizens in the world. In Europe, heat waves and flooding have taken thousands of lives and cost millions in damages. In Australia, wildfires put thousands of properties at risk each year. And even those who have not yet found themselves directly in harm's way can increasingly feel the indirect consequences in their own lives linked to instability abroad, as food prices rise or people are forced to leave their homes.

Increasingly, the richest citizens recognize it too. Tens of thousands of members of the global top 10% joined the massed ranks of 400,000 people in the biggest march for action on climate change in New York last year. Unprecedented numbers are taking action ahead of the adoption of a new global climate agreement in Paris. From Australia to

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*In South Africa, the richest 10% of citizens already have average lifestyle consumption footprints ten times higher than the poorest half of the population. In Brazil it is eight times as high.*

*A weak agreement in Paris is not remotely in the interests of rich high emitters. The only beneficiaries of inadequate climate action are a much smaller elite with vested interests in the continuation of a high carbon and deeply unequal global economy.*

Canada, they are signing petitions, re-thinking their consumer choices, and increasingly voting for alternatives.

The only beneficiaries of inadequate climate action in Paris and beyond are members of a much smaller elite with vested interests in the continuation of a high-carbon and deeply unequal global economy. It is this group that governments in Paris must stand up to on behalf of their citizens; the poorest, least responsible and most vulnerable first and foremost.

**Box 3: Global fossil fuel giants, mega profits, and the carbon baron billionaires who front these companies**

Multinational fossil fuel companies are some of the most profitable on earth – and behind the well-known brands is a club of carbon billionaires. These are the mega rich super-elite who have made their wealth from the business of driving climate change – for which the poorest and most vulnerable pay the highest price.

Between the Copenhagen and Paris climate conferences, the number of billionaires on the Forbes list with interests in fossil fuel activities has risen from 54 in 2010 to 88 in 2015. Over these five years, the size of their combined personal fortunes has expanded from over \$200bn to over \$300bn.<sup>19</sup>

The fossil fuel industry has a lot to lose from ambitious climate regulation – and so it is not surprising that the sector spends millions of dollars every year lobbying to try to influence and delay government action – buying more years to pollute and protect their profits.

Fossil fuel interests declare spending €44m a year on lobbying the EU in Brussels – around €120,000 a day. In the US in 2013, the oil, gas and coal industries spent almost \$157m on lobbying – over \$430,000 per day, or \$24,000 per hour. By comparison, the entire alternative energy sector spent the same amount on lobbying in one year as just the top two spending oil giants, according to the Overseas Development Institute and Oil Change International. As these are self-reported figures in Washington DC and Brussels alone, they are clearly just the tip of the iceberg.<sup>20</sup>

All this investment clearly buys results. One clue is in the subsidies and tax breaks awarded to the fossil fuel sector, which as the OECD shows far outweighs support to the renewables sector. The US government provides \$5.1bn each year in tax deductions for exploration. In each annual budget, President Obama has attempted to repeal some of the most egregious tax breaks, but has been blocked by Congress – many of whose members rely on campaign donations from the fossil fuel industry. The US is now the world's largest producer of both oil and gas, ahead of Saudi Arabia and Russia.<sup>21</sup>

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## 4 Recommendations: A Paris climate deal for the poorest, least responsible and most vulnerable people

While Paris can only be part of the package of measures needed to confront the interlinked crises of economic inequality and climate change, it is vital that it strikes a blow for climate justice in the interests of the poorest, lowest emitting and most vulnerable people, wherever they live. This means the agreement must meet the following four litmus tests as a minimum:

### **1. Does it deliver fair emissions reductions that will keep open the chance of limiting warming below 1.5C?**

- Does it include a ratchet mechanism that ensures the inadequate emissions cuts pledged by countries (INDCs) are increased fairly and adequately by 2020, and every five years thereafter?
- Does it include a long-term global mitigation goal to see fossil fuel emissions fairly phased out and 100% sustainable renewable energy – with universal access – phased in by early in the second half of the century, with developed countries leading the way and providing the support that developing countries require to do the same?

### **2. Does it deliver a major increase in adaptation finance?**

- Does it include a dedicated collective adaptation finance target that will see at least 50% of public climate finance (or at least \$35bn per year) dedicated to adaptation by 2020 as part of a clear roadmap to meet the commitment to mobilize \$100bn per year?
- Does it include new separate climate finance targets for both adaptation and mitigation in the post-2020 agreement set on five yearly cycles, with the level of the adaptation target set commensurate with the level of global mitigation ambition?
- Does it include a commitment to a major increase in resources for the Green Climate Fund during its first replenishment from 2017, and immediately for the Adaptation Fund and Least Developed Countries Fund to ensure a fast-tracking of adaptation resources for those countries, communities and especially women that need them most?
- Does it include a commitment to establish new innovative sources of adaptation finance to halt the stretching of Overseas Development Assistance budgets, such as earmarking of revenues from the European Financial Transaction Tax, and commitments to ensure that carbon pricing schemes direct revenues from high polluters to those least responsible and worst affected by climate change, such as through an automatic set-aside of emissions allowances in the EU Emissions Trading Scheme for the Green Climate Fund?

### **3. Does it recognize the need to address loss and damage from the impacts of climate change to which it is not possible to adapt as a formal part of the new regime, distinct from adaptation?**

### **4. Does it recognize the need to respect the principles of human rights, gender equality and the need for a just transition for workers in the implementation of climate policies at the core of the agreement?**

## NOTES

- 1 The emissions estimates presented in this paper refer to emissions from individual consumption rather than national production, based on the estimates of national consumption emissions provided by Glen Peters of the Center for International Climate and Environmental Research, Oslo. In total, individual consumption makes up 64% of global emissions in the Peters dataset, with the remaining 36% attributed to government consumption, investments (in infrastructure etc) and international transport. A similar study by Chancel and Piketty uses the same dataset but assumes that government consumption and investments can also be attributed to individuals as the ultimate beneficiaries, and finds very similar results. Therefore while Oxfam's estimates strictly relate to the shares of total global emissions associated with individual consumption, they are also sound proxies for the shares of all global emissions.
- 2 *Forbes*, Billionaires list, available in real time at <http://www.forbes.com/billionaires/list/#tab:overall> Annual data taken from list published in March of each year. Billionaires were coded as having business interests or activities in the fossil fuel sector if the description of the source of wealth was interpreted to be related to the fossil fuel sector. In some cases the source of wealth is explicitly listed as 'oil', 'coal', or 'gas', or upstream/downstream sectors like 'oil refining', or 'pipelines'. In others the company name, such as Lukoil, a Russian oil company is given. Some billionaires have interests in more than one sector, including fossil fuels. These are not the same individuals over time; some billionaires may enter or exit this elite group from year to year. Values given in 'Money of the Day' for each year, based on current exchange rates against the US\$. Amounts have been adjusted for inflation.
- 3 L. Chancel and T. Piketty (2015) 'Carbon and Inequality from Kyoto to Paris: Trends in the global inequality of carbon emissions (1998-2013) and prospects for an equitable adaptation fund', <http://piketty.pse.ens.fr/files/ChancelPiketty2015.pdf>
- 4 Global total household consumption emissions in 2007 were 17,187,821,112 tCO<sub>2</sub>. The top 10% richest people globally have per capita emissions of 17.60 tCO<sub>2</sub> and total emissions of 8,431,448,890 tCO<sub>2</sub>, while the bottom 50% poorest people globally have per capita emissions of 1.57 tCO<sub>2</sub> and total emissions of 1,791,265,686 tCO<sub>2</sub>. The average per capita emissions of the top 10% are therefore around 11 times higher than the average emissions of the poorest 50%, and the total emissions of the top 10% are nearly 5 times higher than the total emissions of the poorest 50%. See [technical briefing](#) for full methodological explanation and findings.
- 5 Since we do not consider our approach sufficiently robust at the decile level, we have estimated the lifestyle consumption emissions of the richest 1% on the basis of the richest 10% of citizens in the US, which make up around half the global 1%.
- 6 See note 5.
- 7 The climate vulnerability map is reproduced from Wheeler, David (2011) 'Quantifying Vulnerability to Climate Change: Implications for adaptation finance' <http://www.cgdev.org/page/mapping-impacts-climate-change>. Given the countries missing from Oxfam's income/emissions model, the population size per country of the global bottom 50% is estimated as those living below \$4.40/day in 2012 in 2011 PPP, based on World Bank data which shows approximately 50% of population in developing countries live below this income level – based mainly on consumption data. The \$4.40/day in 2011 PPP is approximately \$2.80 in 2005 PPP, or \$1022/year. The lower limit of the range of emissions on the map is based on the estimated emissions of the bottom 10% poorest in that country. The upper limit is based on identifying the percentile of each country's population that has the highest income from the world income distribution in 2008 (2005 PPP) that is still below \$1022/year and reporting the estimated emissions per capita of that group. The map and these calculations are intended purely for illustrative purposes of the types of countries where the world's poorest 40% live, and the scale of their emissions footprints.
- 8 S. Hallegatte et al. 'Shock Waves: Managing the impacts of climate change on Poverty', <https://openknowledge.worldbank.org/bitstream/handle/10986/22787/9781464806735.pdf>
- 9 C. Pettengell (2015) 'Africa's Smallholders Adapting to Climate Change: The need for national governments and international climate finance to support women producers', <http://policy-practice.oxfam.org.uk/publications/africas-smallholders-adapting-to-climate-change-the-need-for-national-governmen-579620>
- 10 'Rising Seas Disproportionately Threaten Gulf's Poorest', <http://assets.climatecentral.org/pdfs/SLR-PressRelease-LA-MS-AL.pdf>
- 11 D. Baussan (2015) 'Social Cohesion: The Secret Weapon in the Fight for Equitable Climate Resilience', Center for American Progress, <https://www.americanprogress.org/issues/green/report/2015/05/11/112873/social-cohesion-the-secret-weapon-in-the-fight-for-equitable-climate-resilience/>
- 12 A. Ratcliff (2014) 'Hot and Hungry: How to stop climate change derailing the fight against hunger', <https://www.oxfam.org/sites/www.oxfam.org/files/mb-hot-hungry-food-climate-change-250314-en.pdf>
- 13 See for example: <http://www.robertstavinsblog.org/2012/03/16/if-the-durban-platform-opened-a->

- 14 See for example: <http://www.bbc.com/news/science-environment-29239194>
- 15 If we assume that the ratio between consumption and production emissions; the share of national consumption emissions attributed to individual lifestyle consumption; and the distribution of income remains the same today as in 2007, then the average emissions of the richest 10% of Chinese citizens might have increased from 4.7 to 5.9 tCO<sub>2</sub>, compared to the average emissions of the richest 10% of US citizens which we estimated at 50 tCO<sub>2</sub> based on data from 2007/8. Although there are some differences to our respective methodologies, Chancel and Piketty estimate that 10% of the top 10% highest emitters are from China. This would mean around 5% of the Chinese population is amongst the top 10% highest emitters globally (compared to approximately 70% of US citizens), meaning that the top 10% highest emitters in China are very likely significantly lower than the top 10% in OECD countries (note that the Chancel and Piketty study represents its findings in terms of the top 10% highest emitters, while in this paper we look at the top 10% richest people, although there is significant overlap in our findings).
- 16 The highest proportion of the world's poorest people now live in Middle Income Countries, see [http://www.cgdev.org/files/1424922\\_file\\_Sumner\\_brief\\_MIC\\_poor\\_FINAL.pdf](http://www.cgdev.org/files/1424922_file_Sumner_brief_MIC_poor_FINAL.pdf)
- 17 See for example: <http://policy-practice.oxfam.org.uk/publications/for-richer-or-poorer-the-capture-of-growth-and-politics-in-emerging-economies-578757>
- 18 See for example: [https://www.oxfam.org/sites/www.oxfam.org/files/file\\_attachments/cr-even-it-up-extreme-inequality-291014-en.pdf](https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/cr-even-it-up-extreme-inequality-291014-en.pdf)
- 19 *Forbes* Billionaires List, op cit.
- 20 H. Stoddart and L. Prieg, 'Food, Fossil Fuels and Filthy Finance', <http://policy-practice.oxfam.org.uk/publications/food-fossil-fuels-and-filthy-finance-332741>
- 21 E. Bast et al. (2014) 'The Fossil Fuel Bailout: G20 subsidies for oil, gas and coal exploration', <http://priceofoil.org/content/uploads/2014/11/G20-Fossil-Fuel-Bailout-Full.pdf>

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