

# Why Climate Finance Fair Shares Model Metrics Matter

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My blog on “[Why China is Key for the New Climate Finance Goal](#)” summarised the findings of our work on climate finance fair shares. It concluded that the principle of “common but differentiated responsibilities and respective capabilities” itself suggests that richer developing countries that have emitted significant quantities of greenhouse gasses (GHGs)—notably, but by no means only, China—should also start contributing. It also noted that getting the choice of metrics right really matters. This note explains why.

## 1. Eligibility thresholds or fair share allocation models?

China’s role as a potential new climate finance contributor in particular has sparked much discussion. For example, [recent ODI analysis](#) based on eligibility thresholds concludes that China would not qualify.

ODI identified potential new contributors by assessing which countries have levels of historical emissions (since 1990) and current income that exceed the median values of the 23 “Annex II” climate finance providers (essentially the club of developed countries that were members of the Organisation for Economic Co-operation and Development in 1992 and have a legal responsibility to provide climate finance). Crucially, the ODI analysis considered *both* historical emissions and current income in *per capita* terms. This framing helpfully moves beyond narrow definitions of development and responsibility based solely on per capita income and OECD membership. But while most analysts would agree that per capita metrics are the fairest way of considering emissions and income, this approach takes no account of country size. Indeed, it means that small rich states could be identified as new climate finance contributors even if their populations are tiny, while highly populous countries could be excluded even if they had the world’s highest aggregate emissions and national income.

Sure enough, ODI found that only Singapore and Qatar exceeded the Annex II median on both metrics, with Brunei, Israel, South Korea, and UAE also qualifying if the threshold is lowered to “at least three” Annex II countries. China didn’t qualify, being well below the lowest ranked Annex II country on both measures. ODI also assessed which developing countries now have higher GNI per capita and cumulative CO<sub>2</sub> emissions per capita (since 1850) than Annex II countries had in 1990.

They found six countries exceeded the median Annex II country on both metrics, and 25 exceeded the third lowest. But again, China did not qualify, only surpassing the cumulative emissions per capita threshold of at least three Annex II countries.<sup>1</sup>

ODI have argued that their approach is only designed to identify potential contributors, not the *scale* of their contribution. Still, it is problematic if threshold analysis means that potentially important new contributors are *excluded* from any fair shares allocation model. In practice, identifying new contributors and quantifying fair shares should be considered together, and population should be taken into account.

My [original paper](#) did just this by multiplying *total* cumulative historical emissions and current *per capita* income for *all* countries. Two countries with the same aggregate emissions would therefore have “fair shares” in proportion to their per capita incomes, reflecting the UNFCCC and [Paris Agreement’s](#) emphasis on equity and “common but differentiated responsibilities and respective capabilities.” It differed from most previous attempts to quantify fair shares, which typically worked out each country’s share of *total* emissions and of *total* income, and took the *average* of the two shares.<sup>2</sup> My approach thus allowed the easy and simultaneous identification of which new countries should become contributors, *and* how big their shares should be.

## 2. Getting the metrics right

The importance of *not* using per capita metrics for both emissions and income (or indeed *aggregate* emissions and income) when using this formulation can be illustrated as follows.

Suppose we are trying to derive fair shares between two countries (A and B) with identical historical per capita emissions and identical per capita incomes, but A is twice the size (population) of B, and so with aggregate emissions and income twice as large (top left panel in table below). In this example, fair shares based on the product of each country’s *per capita* emissions and *per capita* income (as used in ODI’s eligibility thresholds) would mean A’s share would be *half* that of B’s when expressed in either dollars per capita or as percent of GNI (top right panel).

Conversely, if we allocated shares in proportion to the product of each country’s *aggregate* emissions and *aggregate* income (as used in most previous fair shares analysis that average each country’s share of total emissions and income), then A’s share would be *twice* that of B’s when expressed in either dollars per capita or percent of GNI (bottom left). Only if we use aggregate emissions and per capita income as in our earlier analysis (or *per capita* emissions and *aggregate* income) do we get shares that are equal in terms of dollars per capita or percent of GNI (bottom right).

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<sup>1</sup> ODI also considered vulnerability to climate change as a third metric, although this made little difference to their results and is arguably more relevant as a determinant of climate finance receipts, not responsibility to pay

<sup>2</sup> This use of *aggregate* measures of emissions and income is entirely appropriate for this approach. Some models also incorporated other variables such as population or ODA.

**Table 1. Illustrating impact of different model formulae on fair shares**

Basic country data						1. Fair shares using CO2/hd * GNI/hd					
	Cumulative		Pop (m)	Total	Total	Score	Fair share				
	CO2 t/hd	GNI\$/hd		CO2 (Mt)	GNI (\$m)		%	of \$100m	\$/hd	% GNI	
<b>A</b>	300	10,000	20	6,000	200,000	<b>A</b>	3000000	50%	\$50m	\$2.50	0.025%
<b>B</b>	300	10,000	10	3,000	100,000	<b>B</b>	3000000	50%	\$50m	\$5.00	0.050%
2. Fair shares using CO2 * GNI						3. Fair shares using CO2 * GNI/hd (or CO2/hd * GNI)					
	Score	Fair share				Score	Fair share				
		%	of \$100m	\$/hd	% GNI		%	of \$100m	\$/hd	% GNI	
<b>A</b>	1200000000	80%	\$80m	\$4.00	0.040%	<b>A</b>	60000000	67%	\$67m	\$3.33	0.033%
<b>B</b>	300000000	20%	\$20m	\$2.00	0.020%	<b>B</b>	30000000	33%	\$33m	\$3.33	0.033%

In [this latest paper](#), my co-author and I elaborate on the earlier analysis by separately combining per capita emissions, per capita income, and population in a way that permits more “progressive” formulations to be explored. Nonetheless, the key point still stands: identifying potential new contributors on the basis of per capita emissions and per capita income alone, without factoring in population size, does not work.