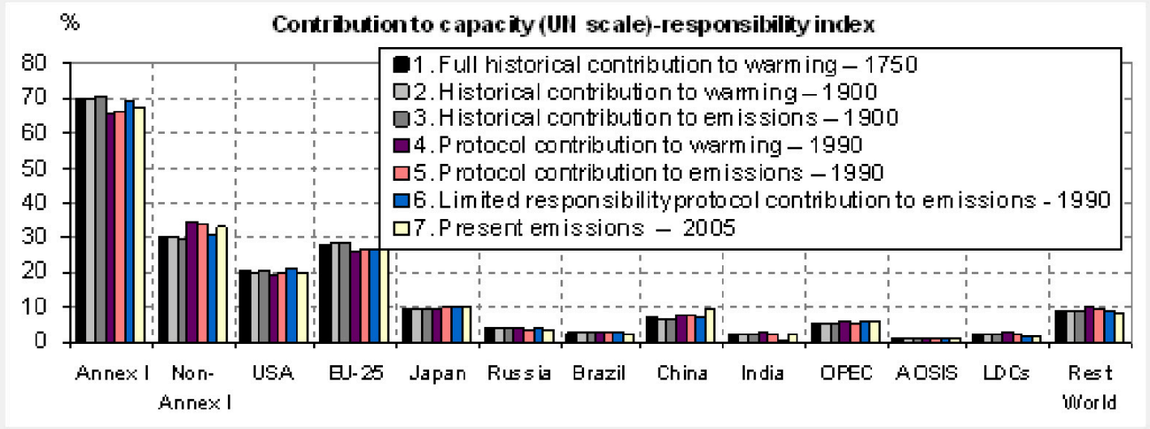
Figure 3. Burden sharing (in percentages) based on CBDR scenarios.



We find that the contribution of The Netherlands to financing adaptation would lie between 0.6% and 1.3% of total global costs, depending on the policy scenario chosen. Assuming costs of climate adaptation is $100 billion per year (UNDP, 2007), the total financial contribution by The Netherlands could range between $600–1.300 million per year, depending on the principles and parameters chosen.

Conclusions

There are many policy choices to be made when establishing the contributions of different countries to climate change. Many alternatives exist, which all have their merits. Using equity as the starting point, several guiding principles are at hand to distribute the costs of global adaptation efforts among countries. These principles have been translated into policy principles which we term responsibility, equality and capacity to pay. Although it is possible to adopt each one of these principles separately, with divergent results, we believe that a politically legitimate and therefore feasible approach would be to find a balance between them by adjusting contributions based on historical responsibility for the capacity to pay, i.e. follow an approach based on common but differentiated responsibilities.

Netherlands Environmental Assessment Agency

VU University amsterdam
Institute for Environmental Studies

Institute for Environmental Studies (IVM), VU University Amsterdam / Netherlands Environmental Assessment Agency (PBL)
mailto:rob.dellink@ivm.vu.nl

IVM POLICY BRIEF

Sharing the burden of adaptation financing

Rob Dellink, Thijs Dekker, Michel den Elzen, Harry Aiking, Jeroen Peters, Joyeeta Gupta, Emmy Bergsma and Frans Berkhout

As irreversible changes to the climate system have been initiated by past emissions (and will depend on future emissions), the focus of international negotiations is broadening from mitigation policy towards adaptation to climate risks. Financial resources to reduce the impacts of climate change through adaptation are, however, likely to fall considerably short of what is needed.
Burden-sharing of adaptation costs to climate change has received limited attention in the literature, and the principles applicable in sharing the burdens of mitigation efforts are not easily transferable to the problem of adaptation.
In this policy brief we establish a conceptual framework that identifies a set of principles that can serve as a basis for choices about how to share the burden of the costs of adaptation to climate change. We show quantitatively what these choices imply for the contributions of different world regions. The research was commissioned by the Netherlands Ministry of Foreign Affairs, Directorate-General for International Cooperation. This policy brief addresses how an international burden sharing regime for adaptation financing may look. It does not address how these funds could be generated or distributed.

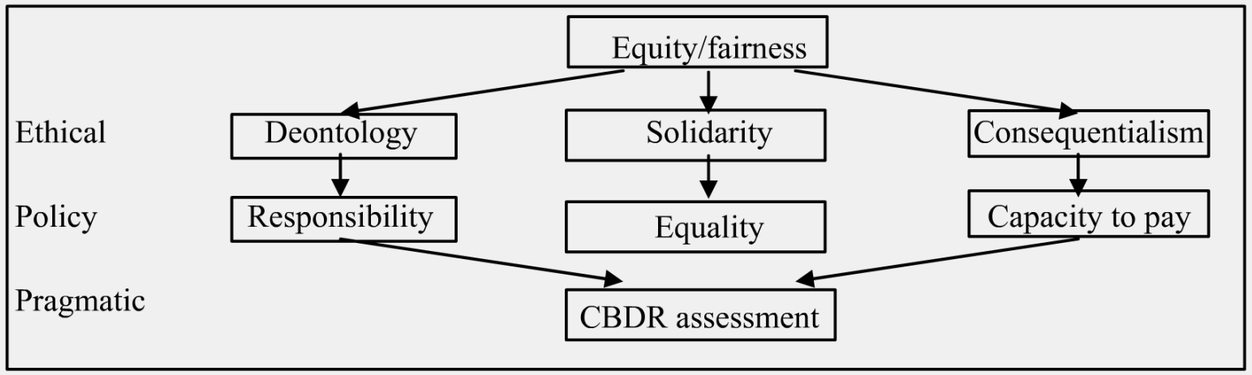
Principles for burden sharing

Three basic principles are identified that may be used to establish a fair burden-sharing regime for international financing of adaptation: *deontology*, *solidarity* and *consequentialism*. Deontology implies that individuals and countries can be held responsible for their acts. It lies at the heart of principles in economics and law, including the Polluter Pays Principle and the No Harm Principle. The main message in practical terms for policy makers is that these principles imply that those most responsible for the problem should also bear the largest burden for dealing with them. However, the inter-temporal effects (emissions have effects for many decades) and attribution (linking specific GHG emissions to climate change-related economic damage) problems associated with climate change impose major difficulties for a direct implementation of the Polluter Pays Principle. Given these problems, we argue that a strict liability principle may not be appropriate, but that states could use a more general notion of *historical responsibility.* The two notions share the same ethical basis.
The solidarity and consequentialism principles are based on sharing the burden in a fair way, irrespective of the previous actions by different countries. The associated dimensions along which the burdens can be shared are then *equality* and *capacity to pay*. Table 1 provides an overview of the discussed principles and their translation into policy dimensions.

Key Findings

- Financing adaptation efforts in developing countries is a growing concern in the UNFCCC, since it is estimated that tens of billions of dollars per year are needed.
- A burden sharing regime for international financing of adaptation, should be based on ethical principles including (historical) responsibility, equality and capacity to pay.
- The establishment of a burden sharing regime for international financing of adaptation based on historical responsibility implies a burden of 50 to 60 percent on Annex I countries.
- If historical responsibility is combined with capacity to pay to form a scenario with Common But Differentiated Responsibility, the share of the burden placed on Annex I countries may rise above 70 percent.

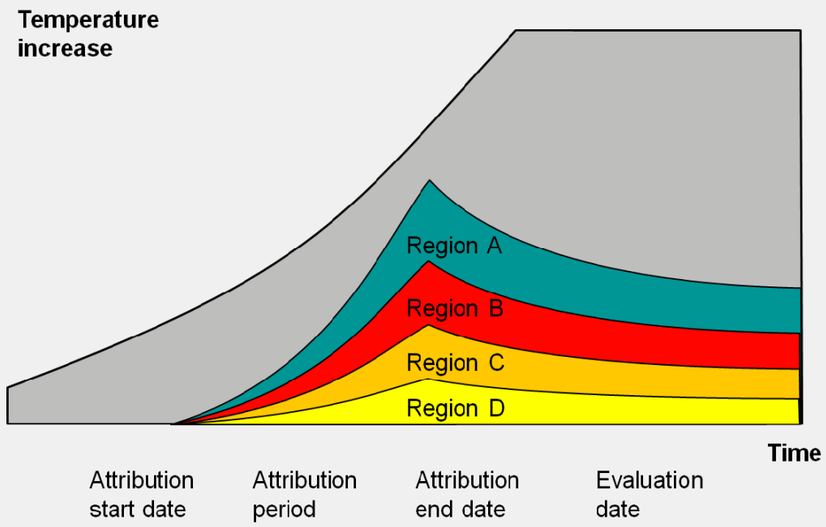
Table 1. From principles to practice



Translating principles into practice

The contribution of different countries to climate change is one of the key aspects of establishing historical responsibilities of countries for adaptation funding as part of a policy based on the Polluter Pay Principle. It is, however, difficult to disentangle historical and current contributions, because historical emissions may have long lasting effects on climate conditions in the future. Figure 1 shows how contributions of regions to temperature increase (as an indicator of the magnitude of climate change) can be established by looking at historical emission patterns.

Figure 1. Attributing climate change to regions



Differences in levels of development of the various countries can be an important complicating factor in the allocation of responsibilities. At this moment the UNFCCC Annex I countries carry the main responsibility for past human contributions to atmospheric greenhouse gas concentrations. However, it should be noted that relative contributions to the climate problem are rapidly changing, in particular through the rapidly increasing emissions of regions such as China. Therefore, in the future the responsibility for the climate problem will be shared by the historically large emitters, as well as rapidly developing countries.

We argue that equality, if interpreted as an equal contribution per capita, is an infeasible criterion for sharing adaptation costs. Financing adaptation on the basis of share in population evidently leads to an unreasonably large burden for the developing countries. We conclude that while equality may be a useful guiding principle when looking at the broader concepts of climate costs, including mitigation costs and damages, they have no practical relevance for a narrower assessment of burden sharing regimes for adaptation financing.

Capacity, i.e. looking at the ability to pay, is more promising. Capacity to Pay approaches that take the economic capacity of a country as a starting point imply that countries should not bear unacceptably high costs.

Ultimately, both responsibility and capacity to pay need to be considered to achieve a balanced burden-sharing regime. We present a number of 'common but differentiated responsibilities' scenarios, combining responsibility and capacity to pay criteria. From a very wide range of possible parameters relevant to responsibility, equality and capacity to pay of different countries, we choose a more limited set of CBDR scenarios that reflect the main policy choices that need to be made.

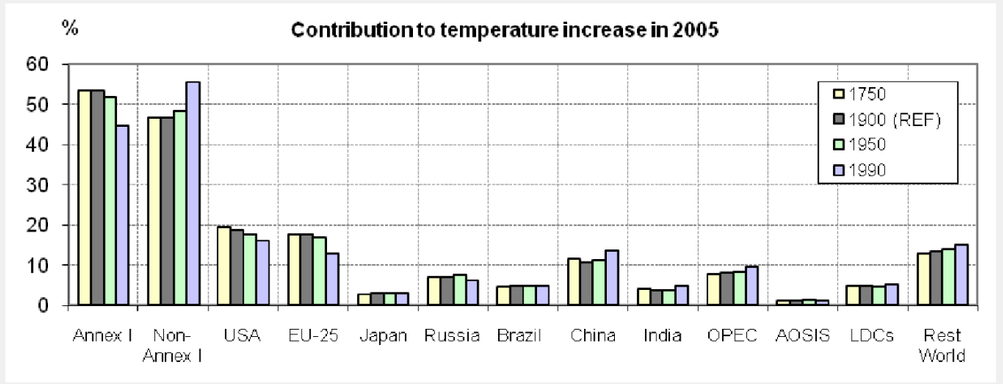
Table 2. Overview of the CBDR scenarios.

Scen.	Name	Description
1	Full historical contribution to warming	*including all GHG emissions from 1750; indicator: temperature change*
2	Historical contribution to warming (default case)	*including all GHG emissions from 1900; indicator: temperature change*
3	Historical contribution to emissions	*including all GHG emissions from 1900; indicator: cumulative emissions*
4	Protocol contribution to warming	*including all GHG emissions from 1990; indicator: temperature change*
5	Protocol contribution to emissions	*including all GHG emissions from 1990; indicator: cumulative emissions*
6	Limited responsibility protocol contribution to emissions	*including all GHG emissions from 1990; indicator: cumulative emissions; correcting for harmless emissions*
7	Present contributions to emission levels	*including all GHG emissions for 2005; indicator: cumulative emissions*

Who should contribute how much?

Quantitative results of applying these scenarios are presented for major world regions in Figure 2, using different starting dates of historical GHG emissions for attribution (1750, 1900, 1950 and 1990). These calculations are based on the MATCH climate model developed by the Netherlands Environmental Assessment Agency and others (www.match-info.net). For the historical responsibility scenarios this shows that UNFCCC Annex I countries carry the greatest responsibility, but a scenario that ignores historical contributions and focuses purely on recent emissions implies a much larger share of the fast-growing developing regions, particularly China.

Figure 2. Burden sharing (in percentages) based on historical responsibility for various attribution start dates.



The results for a set of scenarios based on a Common-But-Differentiated-Responsibilities (CBDR) assessment (with equal weights for responsibility and capacity to pay) are presented in Figure 3. The analysis shows that outcomes are relatively stable across scenarios that vary the calculation parameters (such as the start date for attribution). The outcomes do, however, differ substantially subject to the consideration of capacity to pay. If capacity to pay constraints in developing countries are taken into account (using the UN scale of assessment), historical responsibilities of developing countries are less relevant, and the burden is placed more on Annex I regions.