

Estimating Adaptation Costs in 2030: The UNFCCC Study

By

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Project Goal

- To estimate additional investment and financial flows needed for adaptation in 2030 in selected sectors and not to estimate the global total cost of adaptation
- Clearly a challenging task
 - Adaptation will be widespread and heterogeneous
 - The amount of adaptation needed will depend on the magnitude and the nature of climate change
 - There are few estimates of adaptation costs

Researchers

- Agr, Forestry, Fisheries
 - Bruce McCarl, Texas A&M
- Water Resources
 - Paul Kirshen, Tufts University
- Health
 - Kris Ebi, independent consultant
- Coastal Zones
 - Robert Nicholls, University of Reading
- Ecosystems (no cost estimate included)
 - Pam Berry, Oxford
- Infrastructure
 - David Satterthwaite, IIED, Andrew Dlugowlecki, Erik Haites, Margaree Consulting and Joel Smith

Approaches

- Estimate based on modeling
 - Water supply (scenario A1B)
 - Health (scenario s750)
 - Coastal Resources (scenario A1B)
- Estimate based on current and projected level of investment and financial flows and assumption about adaptation needs
 - Agriculture, forestry, and fisheries
 - Infrastructure
- Difficult to estimate climate change adaptation costs for ecosystems
- The estimates are only for 2030; although water and coastal consider some anticipation

Limitations of These Approaches

- Bottom up
 - Not comprehensive; leaves out many adaptations
 - Adaptations will most likely be diverse
 - Will likely be adaptive learning, e.g., lowering costs
- Top Down
 - Not all components of a sector affected the same if at all
 - Assumption of % increase in cost is arbitrary

Limitations

- The estimation methods yield crude estimates of costs and **results should be treated as indicative**
- The estimates **may be low because** the amount actually required for adaptation because some sectors and sub sectors that are likely to need additional financial and investment flows to adapt to climate change impacts have not been included.
- The estimates **may also be high because**:
 - There could be some **double counting**;
 - No consideration of **adaptive learning** which could reduce adaptation costs.

Adaptation and development

- For all of the sectors examined herein, there is a substantial deficit in current investment and financial flows
- In many places property and activities are insufficiently adapted to current climate, including its variability and extremes

Findings

Additional investment and financial flows in 2030

Sector	Global (billion USD)	Assumed share of developing countries
Agriculture, forestry and fisheries	14	50 %
Water supply	11	80 %
Human Health	5	100 %
Coastal zone	11	40 %
Infrastructure	8–130	25 %

Agriculture, Forestry and Fisheries

- Assumed % increase in total agriculture investment
- Estimate is USD 14 billion
 - USD 3 billion for R&D and extension activities
 - USD 11 billion for production and processing
- A large share of additional investment needed will be in physical assets owned by private sector agents



Water Resources



- Bottom up approach
- Study only examined change in demand for water supply
 - Treatment, flood protection, etc. not estimated
- Assume anticipation of impacts to 2050
- Estimate is USD 11 billion
 - 80% in developing countries
- Majority of financing currently come from domestic public sector.
- New domestic and external public resources will likely be needed.

Human Health

- Study only examined the additional cost of treatment related to additional cases of malaria, diarrhoeal disease, and malnutrition
- Estimate is USD 5 billion
 - Entirely in developing countries
- Likely to be paid for mainly by the families of those affected
- New and additional public financing will likely be necessary for families that cannot cope



Coastal Zones



- Study only considers the cost of construction of dykes and beach nourishment
- Assumed anticipation of sea level rise to 2080
- Estimate is USD 11 billion
 - About half in non-Annex I countries
- Sector highly dependent on public sources of funding.
- Deltaic regions, particularly in Asia and in Africa may need additional sources of external public financing

Infrastructure

- Top down: total investment up by 5 to 20%
- Largest sector
 - Estimate range from USD 8 billion to USD 130 billion
 - Wide range indicates uncertainty
 - May be overlap with other sectors
- Likely to affect public and privately financed infrastructure
- Public policies could affect infrastructure design requirements.



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Global: Overall needs identified in this study correspond to 0.2 – 0.8 % of global investment flows or 0.06- 0.21 % of projected GDP in 2030.

Developing countries: USD 28 to 67 billion in 2030.

Amount large in absolute terms, but small relative to GDP and investment

Interpreting the Results

- Investment and financial flows needed for adaptation are likely to be tens of billions of dollars per year several decades from now
 - Could more than USD 100 billion per year
 - Other studies (World Bank, Oxfam) also estimate adaptation costs at tens of billions of dollars per year
- Actual costs will be sensitive to many factors including how much climate change is realized
 - That will be affected by the level of emissions
- Is possible these investments are not made

Where would \$10's B Come From?

- Total Funding for climate change adaptation under UNFCCC \$100s of billions
 - Would take massive increase
- Total ODA in 2000 about \$70 billion
 - Would require substantial diversion
- Total FDI in 2000 \$1.2 trillion; total GFCF > \$6 trillion
 - Would be small diversions from those sources

How Will Adaptation Needs be Addressed?

- Dedicated Funds
 - Unlikely to be sufficient funds
 - One challenge is how to ensure funding goes to needed parties when they need it
- As part of routine investment
 - CC folded with other considerations
 - Suggests would come from current funding sources
- Either way will the poor receive funding?
- Who pays is a policy matter
 - Will there be credits?

Thank You!