GREEN CLIMATE FUND | Independent Evaluation Unit

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SCALE, DEPTH, AND DURATION - EXAMPLES OF TRANSFORMATIONAL CHANGE IN THE ENERGY AND PUBLIC HEALTH SECTORS[1]

Mitigation and adaptation interventions are striving to have transformational effects. The Green Climate Fund (GCF) aims to achieve this by accelerating climate innovation, mobilising finance at scale, and greening the financial sector. Alongside the Climate Investment Funds Evaluation and Learning Initiative, the Independent Evaluation Unit of the GCF has combined two different evidence reviews into one learning exercise on transformational change.

This evidence review makes an ambitious attempt at increasing our understanding about transformational change in the context of climate change. It contributes to debates on transformational change by:

- covering a precise, but extensive, list of interventions and outcomes within the energy and public health sectors.
- combining EGMs with systematic reviews in the two sectors, highlighting where research is comprehensive and where there appears to be a lack of such evidence.
- offering specific examples of interventions that have shown effects with scale, depth, and duration.

We approached this exercise directly by focusing on the energy sector in developing countries. We also approached this learning exercise indirectly by reviewing evidence from a sector not often associated with climate change – the public health sector – focusing on behavioural interventions (as this sector has the longest tradition of long-term studies on behavioural science).

The review collated and reviewed quantitative studies from experimental and quasi-experimental studies, combined evidence gap maps (EGMs) on energy and public health, with systematic reviews on key intervention/outcome combinations. In total, 32,909 articles from 13 databases were retrieved with 19,402 titles and abstracts screened. The EGMs included 96 studies in the energy sector map and 144 studies in the public health map. The systematic reviews included 31 energy studies and 53 public health studies.

In this joint evidence review for the two sectors, transformational change was operationalised using three measurable criteria:

1 *Scale, depth and duration - Examples of transformational change in the energy and public health sectors. Learning paper, (May). Songdo, South Korea: Independent Evaluation Unit, Green Climate Fund*

1. The depth of change (a Cohen's d effect size of over 0.8)
2. The scale of change (whole administrative area, or over 1,000 beneficiaries)
3. Sustained change (at least one year)

Whilst a range of intervention and outcome areas were covered across both sectors, some were populated with more studies than others. The energy EGM shows that investments for infrastructure, equipment, and technologies was the most populated intervention. In terms of outcomes, the most frequent area was energy consumption and demand. The public health EGM illustrates that enablement, defined as support that reduces barriers or increases capabilities, was the most frequent intervention type. Health-seeking behaviour with largely private benefits was the most frequent outcome.

Findings from the energy sector systematic review offer some interesting, yet ultimately, mixed results. For example, the energy systematic review focused on two areas: first, the effects of electrification in the workplace; and second, the effects of a pilot emission trading scheme (ETS) in China. Regarding the first area, findings indicated a greater number of women were employed, showing the potential for energy interventions to transform women's lives and facilitate gender parity. However, publication bias and variance between studies meant this estimate was reduced downwards below the threshold for a small effect size.

The second area focused on the Chinese pilot ETS and showed a reduction of emissions of 17 per cent (representing a Cohen's d figure of -1, a large effect size). However, the influence of publication bias and a lack of high-confidence studies casts doubt on this estimate. Overall, in the absence of publication bias, this intervention would be a candidate for transformational change as defined by this study. However, it is unclear how large the effects truly are – it is likely that they are considerably smaller.

Within the public health systematic review, support to reduce barriers or increase capabilities (enablement) showed the greatest potential for transformational change (with effect sizes ranging from small to very large), especially for consumption or purchasing decisions. However, meta-regression results, which included a range of control variables, reduced these effects sizes and the significance level considerably (due to between-study variance).

Overall, this evidence review assesses how lessons in two sectors may help to inform transformational climate mitigation and adaptation investments, including GCF and CIF programming to accelerate paths towards low-carbon, climate-resilient development pathways.

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