ISDC INTERNATIONAL SECURITY AND DEVELOPMENT CENTER

SYSTEMATIC EVIDENCE REVIEW

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April 2026

WHAT WE KNOW ABOUT RECONSTRUCTION IN FRAGILE CONTEXTS

Luke Hosford
Neil T. N. Ferguson
Tatiana Orozco Garcia
Lame Ungwang

ISDC - International Security and Development Center gGmbH
Gerichtstr. 49, 13347 Berlin, Germany
www.isdc.org

Acknowledgments

This report was made possible with funding from Division 222 – Crisis Management, Reconstruction, Transitional Development Assistance of the German Federal Ministry for Economic Cooperation and Development (BMZ). The project was carried out in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The views and opinions expressed in this report are those of the authors alone and do not necessarily reflect those of the donor.

Executive Summary

Before, during and after conflict, highly fragile countries face uncertain social and economic futures. Some countries recover, while others fall into conflict traps but all experience the deleterious and costly effects of violence. To support countries to rebuild and towards sustainable social and economic stability, BMZ draws on Transitional Development Assistance (TDA), which is designed to support the reconstruction of physical infrastructure in highly fragile and conflict-affected places. Especially in the current climate, when needs for reconstruction support are increasing, while budgets come under increasing pressure, it is important to understand if this support works towards achieving its aims and how it does so.

To this end, this research undertook a series of structured reviews of academic, grey and agency literature to understand the quantity and quality of evidence that connects key infrastructure development inputs to both direct and downstream impacts. We consider eight main thematic areas, which have been the main focus of TDA investments in recent years: WASH, Institutions, Civic Engagement, Peacebuilding, Economic and Livelihoods Interventions, MHPSS, Health and Education. We consider evidence produced in all countries that have received TDA in recent funding cycles, as well as an additional list of highly fragile places that are, in principle, eligible to receive TDA and consider relatively recent evidence produced in the last 10 years. Studies were identified using keyword searches of major research databases, then evaluated for their relevance to the geographic, temporal and thematic scope of the review.

The research took a hierarchical approach to sorting evidence. First, causal evidence was collected from randomized control trials and quasi-experimental impact evaluations of key relationships. When key relationships could be confirmed from such studies, no additional information was sought. When this evidence was absent or inconsistent, additional inputs were considered, which were identified through searches of the document libraries of key donors and implementers.

Overall, we find that while the full universe of evidence on the key themes of this work is large, only a very small proportion of this work focuses on evaluations of infrastructure interventions in highly fragile settings. Accordingly, only 99 causal impact evaluations and less than 200 documents overall were reviewed in depth in this analysis. In this regard, even when there is evidence of causal learning, key takeaways typically rely on fewer than five studies. Key findings should, therefore, be understood in the context of the relatively lack of recent evidence in this field.

Despite this, in some areas knowledge is comparatively strong. WASH infrastructure, including wells, boreholes and latrines, are frequently observed to improve access, quality and satisfaction. Infrastructure in support of institutions and peacebuilding are associated with positive outcomes for local economies, as well as cooperation in those communities. By contrast, knowledge is more limited in other areas. For example, despite substantial evaluations of livelihoods programming more broadly, the reviews uncover no evidence linking livelihoods infrastructure to key outcomes. There is little evidence that supports links between infrastructure inputs and long-term outcomes generally, nor that related to long-term economic and social stability. Key amongst these gaps is that there is little evidence that assesses the extent to which reconstruction support can, in the long-term, prevent countries from sliding back into crisis. This is a key goal of TDA and future work should be supported to close these high-level gaps.

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1. Introduction

Both during and after war and other episodes of violence, countries face uncertain economic, social and political futures. Some might return to long-term growth paths,[1] and others might even outstrip them.[2] Many, however, become stuck in conflict traps.[3] Even in the best cases, the experience of war and fragility is costly. It is deleterious to infrastructure and capital, physical and human.[4] Not only can violence destroy key infrastructure, such as schools, hospitals and WASH facilities (the supply side); it can also change how such facilities are used, if they are used at all (the demand side), and accordingly the benefits that arise from their use. This calls for efforts to rebuild and reconstruct missing, damaged or lost infrastructure, as well as to support the restoration of behavioural and social norms around their use.

To this end and to support this reconstruction, BMZ draws on transitional development assistance (TDA). The purpose of TDA is to strengthen the resilience of local structures and the people who use them in a way that can be sustained during and after the experience of a crisis; and to reduce the potential that new crises emerge. The possibility of TDA to mitigate the deleterious effects of crises and to support post-crisis recovery is clear. In terms of both the scale and nature of the threats faced and with decreasing budgets, it is a particularly challenging time for the development, humanitarian and peacebuilding sectors. For this reason, it is increasingly important to understand what works well, what might not deliver as expected, and where key knowledge gaps lie.

In this report, we analyse and synthesise findings from a series of structured literature reviews that seek to understand the quantity and quality of evidence around the impacts of key intervention types implemented under TDA. In this review, we group these intervention types into four thematic areas: Water, Sanitation and Hygiene (WASH); Institutions, Civic Engagement and Peacebuilding; Economic and Livelihoods Interventions; MHPSS, Health and Education. We include a section that provides insight across these, and other, thematic areas.

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[1] Barakat, S., & Zyck, S. A. (2009). The evolution of post-conflict recovery. *Third world quarterly*, *30*(6), 1069-1086; Brown, G., Langer, A., & Stewart, F. (2011). A typology of post-conflict environments. *CRPD Working Paper*, *1*, 1-22.

[2] Reichel, R. (2001). Germany's Postwar Growth: Economics Miracle or Reconstruction Boom. *Cato J.*, *21*, 427.

[3] Collier, P. (2003). *Breaking the conflict trap: Civil war and development policy* (Vol. 41181, No. 4). World Bank Publications.

[4] Colletta, N. J., & Cullen, M. L. (2000). Violent conflict and the transformation of social capital: Lessons from Cambodia, Rwanda, Guatemala, and Somalia (Vol. 795). World Bank Publications; Blattman, C., & Miguel, E. (2010). Civil war. Journal of Economic literature, 48(1), 3-57.

Operationally, the research considered: efforts to (re)construct physical infrastructure delivered in highly fragile places (which we denote as "Infrastructure" throughout; efforts to develop capacity around the use, management and repair of this infrastructure (which we denote "Infrastructure+"); and on the provision of equipment to support the use and / or maintenance of the infrastructure (denoted "Equipment"). The work seeks to assess the extent, nature and quality of the evidence around interventions of this type implemented in reconstruction settings. Such settings are different in a number of fundamental ways, which make it difficult to directly apply knowledge derived from more general settings. The theories of change that underpin infrastructure development and its use in relatively stable places might not hold in less stable settings. Schools or hospitals might be understaffed in less stable places. People, similarly, might be deterred from using such facilities if they perceive the place, or the journey there, to be dangerous.[5] For this reason, while we note that substantial bodies of evidence are available in broader development settings,[6] we focus our attention only on countries that have received TDA from BMZ and an additional list of countries deemed comparable to TDA recipients. Specifically, these are countries with a reported level of fragility above 90 ("highly-fragile") in the Fragile States Index.[7]

Within each thematic area, the work considers the outcome of reconstruction interventions at two main levels. The first considers impacts directly linked to the (re)construction of the physical infrastructure (which we denote as the "Direct Level". This includes improved access to the infrastructure, improved (perceptions of) quality of the infrastructure and increased satisfaction with it. The second considers impacts on downstream indicators (which we denote the "Outcome Level". This considers the set of indicators that should change as the quality of and access to infrastructure improves. In the case of WASH, for example, direct outcomes include improved access, quality and satisfaction with WASH facilities, such as pumps, boreholes and latrines. Outcome level impacts consider associated impacts of this improved access, such as reductions in the experience of infectious diseases, like diarrhoea. In the case of education, in another example, direct outcomes would include improved access, quality and satisfaction with

[5] Brück, T., Díaz Botía, O. M., Ferguson, N. T., Ouédraogo, J., & Ziegelhöfer, Z. (2019). Assets for alimentation? The nutritional impact of assets-based programming in Niger. *The Journal of Development Studies*, *55*(sup1), 55-74.

[6] E.g., Conn, Katharine M. "Identifying effective education interventions in sub-Saharan Africa: A meta-analysis of impact evaluations." *Review of educational research* 87.5 (2017): 863-898; Sharma Waddington, H., Masset, E., Bick, S., & Cairncross, S. (2023). Impact on childhood mortality of interventions to improve drinking water, sanitation, and hygiene (WASH) to households: systematic review and meta-analysis. *PLoS medicine*, *20*(4), e1004215; McCoy, D. C., Hall, J. A., & Ridge, M. (2012). A systematic review of the literature for evidence on health facility committees in low-and middle-income countries. *Health policy and planning*, *27*(6), 449-466.

[7] Fund for Peace (2024): "Fragile States Index 2024"

education facilities. Outcome level indicators include enrolment rates, educational attainment and, in the longer term, future life outcomes, among other outcomes. A third level, which addresses the aim of TDA in fragile contexts to avoid sliding back into crisis was also considered at the outset of this review but scant evidence could be found that interventions had been assessed against criteria associated with reduced crisis risk.

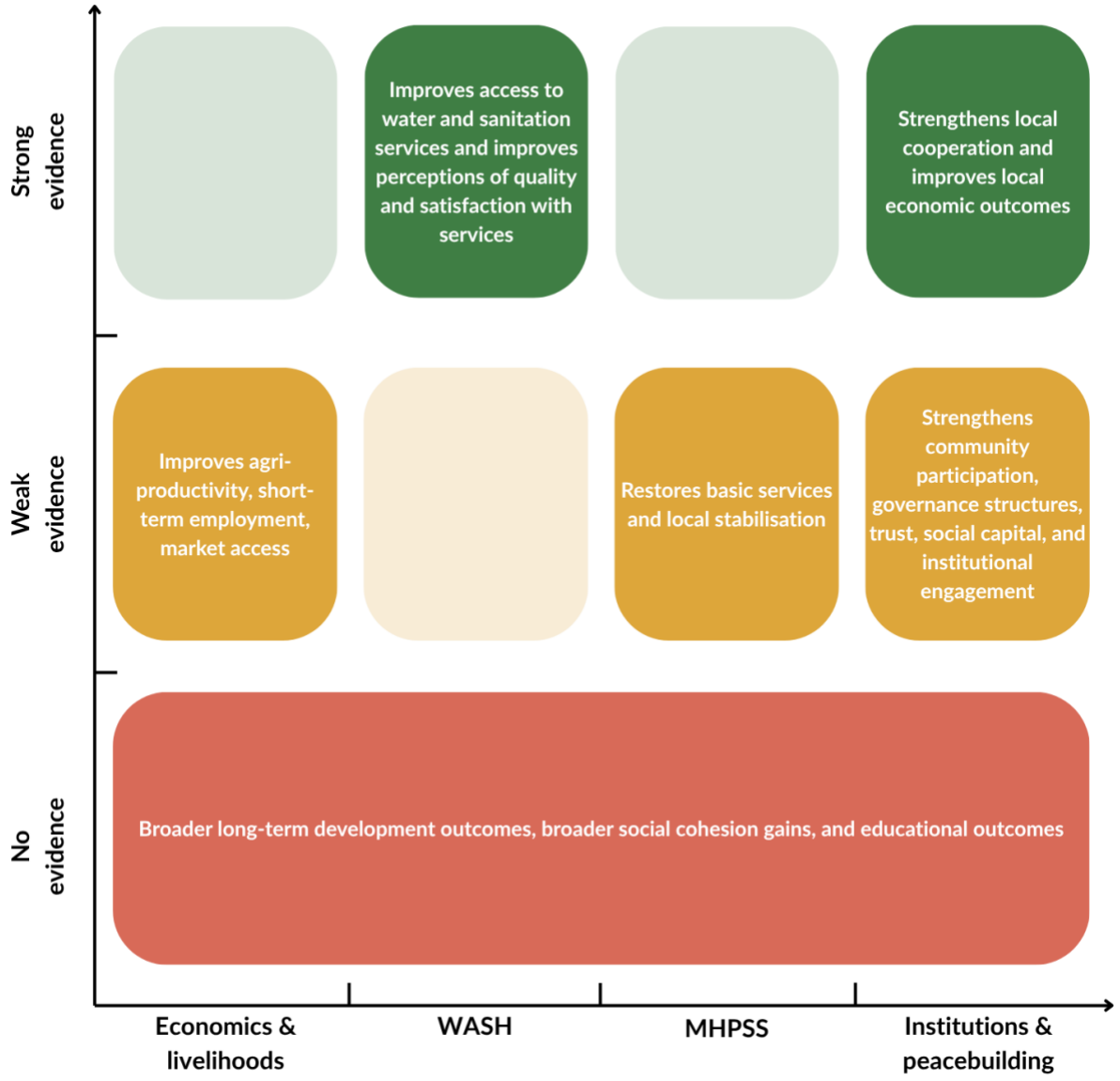

Figure 1: Summary of positive effect findings of infrastructure interventions per thematic area (75 studies included)

2. Approach and Methodology

This evidence review was conducted under the principle of a "hierarchical" approach to collecting and sorting evidence. This means that in the first round of data collection, we focused attention on rigorous evidence coming from randomized control trials (RCTs) and quasi-experimental studies. In situations where such evidence was available, additional sources were not sought. Where key knowledge gaps might emerge, additional sources, such as thematic reviews and agency M&E documentation were considered and reviewed. This is based on the principle that when highly rigorous evidence exists, knowledge frontiers are not expanded by the inclusion of non-causal evidence. By contrast, when highly rigorous studies could not be found, our understanding of the knowledge frontier can be better defined with the inclusion of non-causal sources. In this regard, we sought to understand and differentiate between the quality of the available evidence, while reflecting its full quantity.

In the reviews, we consider the "unit of analysis" to be individual projects. That is, interest falls on specific interventions, or combinations thereof, implemented in a specific place at a specific time. In the case of WASH, this could be the building of latrines within a set geographic and temporal limits and/or training to change behaviours around the use of these latrines. In the case of health, the provision of hospital buildings and/or healthcare worker training; and so on. This means that the work did not consider wider strategic reviews, which might look at a broader array of intervention types taking place within a set temporal and geographic scope; or topical reviews, which focus on a specific type of intervention over a broader temporal and / or geographic scope.[8]

In order to identify the main intervention types that comprised reconstruction support under TDA, the research team engaged in consultations with counterparts at GIZ and BMZ to gather insights and perspectives on the key areas and interventions to which TDA was most commonly directed. This generated a list of broad thematic areas that were the main focus of support and, accordingly, the focus of this review: WASH; Institutions, Civic Engagement and Peacebuilding; Livelihoods; MHPSS; Health; and Education.

Each thematic area was approached in the same way, with four key questions underpinning the work:

- For which interventions of each typology is there strongest evidence in highly fragile settings?

[8] By contrast, the work does include prior relevant *systematic* reviews, which do exactly this. However, individual papers from these reviews were used as source data (that is, to improve our identification of relevant papers for the review) in this work, rather than broader lessons and conclusions from these systematic reviews being reflected in our findings and conclusions.

- For which is there only weaker or anecdotal evidence?
- Are there combinations of inputs and outcomes that are not backed-up by any forms of evidence?
- What potential reasons could there be for the absence of this evidence?

Within each of the thematic areas, the work considered infrastructure and infrastructure-related interventions. This included interventions that repaired, rebuilt, maintained or created new infrastructure; those that provided equipment related to the creation, repair or maintenance of that infrastructure; and those that provided training related to the infrastructure. Particularly in the latter two aspects, broad definitions were applied. We consider three kinds of training: training relating to the direct upkeep of the infrastructure; training related to its management; and training relating to its use. Similarly, we considered training interventions that were both bundled with infrastructure development and those that took place independently of them (e.g., pertaining to existing infrastructure). In the case of equipment, we consider equipment necessary to both maintaining and repairing infrastructure (e.g., tools), and equipment necessary for it to function.

2.1. Scope of the Review

In order to maximise the relevance of this work to current reconstruction strategies and TDA priorities, a number of scoping conditions for the work were implemented. This involved identifying the locations and intervention types that were of interest to the study. Similar consideration was given to the timeframe that would be relevant and of interest for the project. The constraints imposed by these scoping conditions are discussed below. Based on the outcomes of these considerations, sources of information were identified, in order to produce a “longlist” of studies of interest that matched the contexts, timeframe and intervention types of interest. These documents were then scanned for their relevance to the literature review and those deemed relevant were reviewed more deeply in order to garner key information. In a final step, key quality indicators were applied to the nature of the evidence found. The approaches taken in each of these steps are outlined below.

2.1.1. Interventions of Interest

A scoping condition is related to the kinds of interventions that should populate the reviews. Two main approaches were taken to determine the intervention typologies that would be the focus of this work. In order to offer a sharper definition than the broadly defined TDA action field "rebuilding basic infrastructure and services", we operationalised "reconstruction" as interventions that relate to physical infrastructure. This is based, first, on the definitions of BMZ and GIZ. These definitions suggest that reconstruction involves the direct creation, refurbishment, repair or maintenance of infrastructure items and

everything that pertains to its presence, maintenance and use. Accordingly, attention was focussed on interventions directly relating to infrastructure. Second, we needed to decide which broad intervention types, in which thematic areas, were of interest. To do so, we considered recent GIZ and BMZ categories and associated funding strategies and priorities. To this end, GIZ and BMZ provided a list of project categories that had been supported, at least in part, by TDA, in their most recent funding cycles. These projects were then aggregated into the thematic focus areas that are considered in these reviews.

Water, Sanitation and Hygiene (WASH)	**Institutions, Civic Engagement, and**	**Economic and Livelihoods Interventions**	**MHPSS, Health and Education**

Figure 2: Main thematic areas

2.1.2. Outcomes of Interest

This review identifies two outcome clusters of interest: the "direct" and "outcome" levels. The direct effect considers the provision of the infrastructure. In turn, key outcomes relate to access to the infrastructure, perceptions of its quality, and satisfaction with it. The "outcome level" considers the potential outcomes relating to the (appropriate) use of the infrastructure. These indicators, therefore, go beyond access and consider measurable changes in the lives of those who receive access to the infrastructure. Some consideration is also given to outcomes that might be considered spillovers from or positive externalities to the interventions, matching the desire of TDA to reduce the risk of falling back into crisis. These could include, for example, impacts on reducing conflict risk, boosting social cohesion or other outcomes related to peacebuilding. However, such outcomes are, typically, beyond the stated aims of most reconstruction projects. Accordingly, while we report on such outcomes in the rare cases when they are studied, we do not include a broader lack of evidence on such outcomes amongst key knowledge gaps.

2.1.3. Country Contexts

A key question arises about the settings and countries in which TDA could, or is, a relevant funding instrument. In order to identify the focus countries of the study, we first sought to understand the countries that received, or are eligible to receive, TDA. This was based

on a list provided by GIZ and BMZ, again based on recent funding cycles. Noting that list included many, but not all, highly fragile countries from which important lessons could be drawn, the list was augmented to include all countries that had a level of fragility, according to the Fragile States Index, of over 90 (the threshold for highly fragile countries) in at least one of the last five years. This decision was taken in order to maximise the potential number of studies included in the reviews, while still ensuring comparability between countries receiving TDA and the countries from which the evidence base could be drawn. This sought to include settings where it is feasible to expect theories of change and learning that could be applicable to TDA recipients.[9] We restrict our attention to studies that took place in countries that had recently received TDA or had recently had a level of fragility over 90 according to the Fragile States Index.

2.1.4. Temporal Scope

The focus of this work is on studies produced within the last decade (that is, since 2015). This decision was taken in order to maximise the relevance of the information reviewed in this work to current TDA and reconstruction strategies. It was important that the kinds of interventions considered in the literature were pertinent to the actual activities currently supported by reconstructing expenditure. Accordingly, scope was restricted to recent studies focussing on recent programmatic and knowledge strategies.

2.2. Methodological Approach to the Review

To identify the studies that underpin these reviews, a multi-stage approach was taken. First, we implemented a "hierarchy of evidence" approach. In this approach, we first sought rigorous statistical analyses that linked the interventions of interest to direct and outcome level effects, using experimental or quasi-experimental methods. The gold standard of evidence for assessing a theory of change (linking an intervention of interest to a particular outcome or effect) is an experimental method like a Randomised Control Trial (RCT). However, for a range of reasons, randomisation might not be feasible in all contexts and a range of quasi-experimental methods are used throughout the literature. In both cases, we consider evidence from randomised and quasi-experimental studies to provide evidence for a *causal* relationship between a given input and set of impacts.

Based on the assumption that, for input-impact sets that were the focus of rigorous, quantitative, impact evaluations, the knowledge frontier would not be advanced by the addition of non-causal or narrative evidence, additional evidence was not sought for such sets. To identify this evidence, we conducted several keyword searches of key academic

[9] A small number of TDA recipients including Bangladesh (85.9); Iraq (88.6); Kenya (86.5); Mauritania (87); Thailand (66.2); Türkiye and (84) did not surpass the highly-fragile threshold in 2025. With the exception of Thailand, however, all are within range of the threshold and, historically, have been above it.

databases. We discuss these approaches in more detail below. In settings where no causal evidence could be found, a subsequent approach was undertaken to search grey and agency literature sources that might not meet the causal identification threshold but still provided learning on key input-impact sets. This includes endline reports, evaluations and other monitoring and evaluation information published by implementation agencies and/or donors that considered the effectiveness of these interventions. In settings where causal information was not available, the inclusion of such information still improves understanding of the knowledge on this intervention.

2.2.1. Review of Causal Sources

The review of academic sources aimed to find studies that show clear causal links between intervention types and key results. To find these studies, we followed several steps:

Initially, we developed a range of keyword searches that were applied to the Google Scholar database. Google Scholar was chosen over alternative databases, such as Web of Science, as it afforded access to a greater array of document types, including peer-reviewed works, working articles and pre-prints, as well as some grey literature. The keywords used related to the intervention type in the most generic of senses (e.g., "WASH") but did not seek to specify, at that point, other relevant factors other than the location of the study. This was designed to create maximal lists of potentially relevant studies.

We considered two main kinds of articles: those presenting primary research, and those that presented systematic reviews or meta-analyses. All those presenting primary research were included in a longlist of sources. Reviews and meta-analyses were not included directly but the individual research articles included in them were reviewed and any additional papers not already included in the longlist were added. The keyword searches used to source material in existing review articles were re-run in order to bring in new articles not captured by our own keyword searches and published since those reviews. Titles and abstracts were then scanned for their relevance to the study. In total, this produced a longlist of over 2000 papers across the relevant thematic areas of this study.

The longlist was then reviewed against a set of relevance criteria. First, articles were assessed against the scope criteria (geographic, temporal, topical). Articles that did not match the scoping criteria were removed from the list. Second, the remaining articles were assessed against the intervention type, with all those not matching the infrastructure and infrastructure-related focus removed. Finally, they were assessed for the scientific quality of the work and the methodological approach taken. All those that could not make meaningful claims to causal identification were removed and placed on a "reserve list". This left a list of 148 articles across the relevant thematic areas, which were reviewed in

more detail to assess their direct relevance to the study. Based on these deep reviews, 99 were determined to be of sufficient quality and relevance for inclusion in the study.

2.2.2. Review of Non-Causal Sources

Where key gaps emerged in the review of the causal evidence, we assessed the extent to which non-causal evidence might close these gaps. Three approaches were considered and implemented. First, we re-reviewed the "reserve list" from the academic search. Second, we sought to find documentation in the online libraries of key implementing organisations. These libraries were searched based on the scoping boundaries of this study. The lists of all documents that matched the thematic focus areas of this review were then evaluated.

However, in most cases, the kinds of evaluations reported in these documents did not align with the unit of analysis of this report. Most reviews tended towards one of two types. The first were reviews of all activities undertaken by an organisation in a location across a specific timeframe (usually a year, reporting period or strategy period). The second were reviews of interventions of a given type, studied across multiple countries or settings. In both cases, the analyses were focused on drawing broad lessons on either a location or a theme. Accordingly, their inclusion in our databases could have risked drawing in learning from countries not a part of this review, or from intervention types not relevant to this review. For example, in the case of WASH-based interventions, we conducted reviews of the databases of UNICEF, IOM and WHO, three of the largest players in the WASH field. This returned over 1000 documents. However, only one of these documents matched the relevance and unit of analysis requirements for this project (specifically, a UNICEF report in Niger focusing on the UNICEF/DGIS Programme for Accelerating Access to Sanitation and Water for All). M&E, endline reports and other evaluations at the project level were almost entirely absent from these public databases.

Accordingly, a third approach was undertaken, which involved similar searches being undertaken of GIZ and KfW document libraries. The documents uncovered in this approach were significantly fewer in number but 66 relevant documents passed the scope and relevance criteria of this work and addressed key gaps that emerged from the review of causal literature. These documents, typically, focused on "strategies" but were more tractable at our unit of analysis, as they focused on specific clusters of investments on a given theme, in a given place, for a given period of time. While this meant that causality could not be attributed generally, nor to specific aspects of the strategy under review, additional lessons could be learned about some of the key gaps that emerged in the review of causal evidence. These approaches are shown in Figure 2.

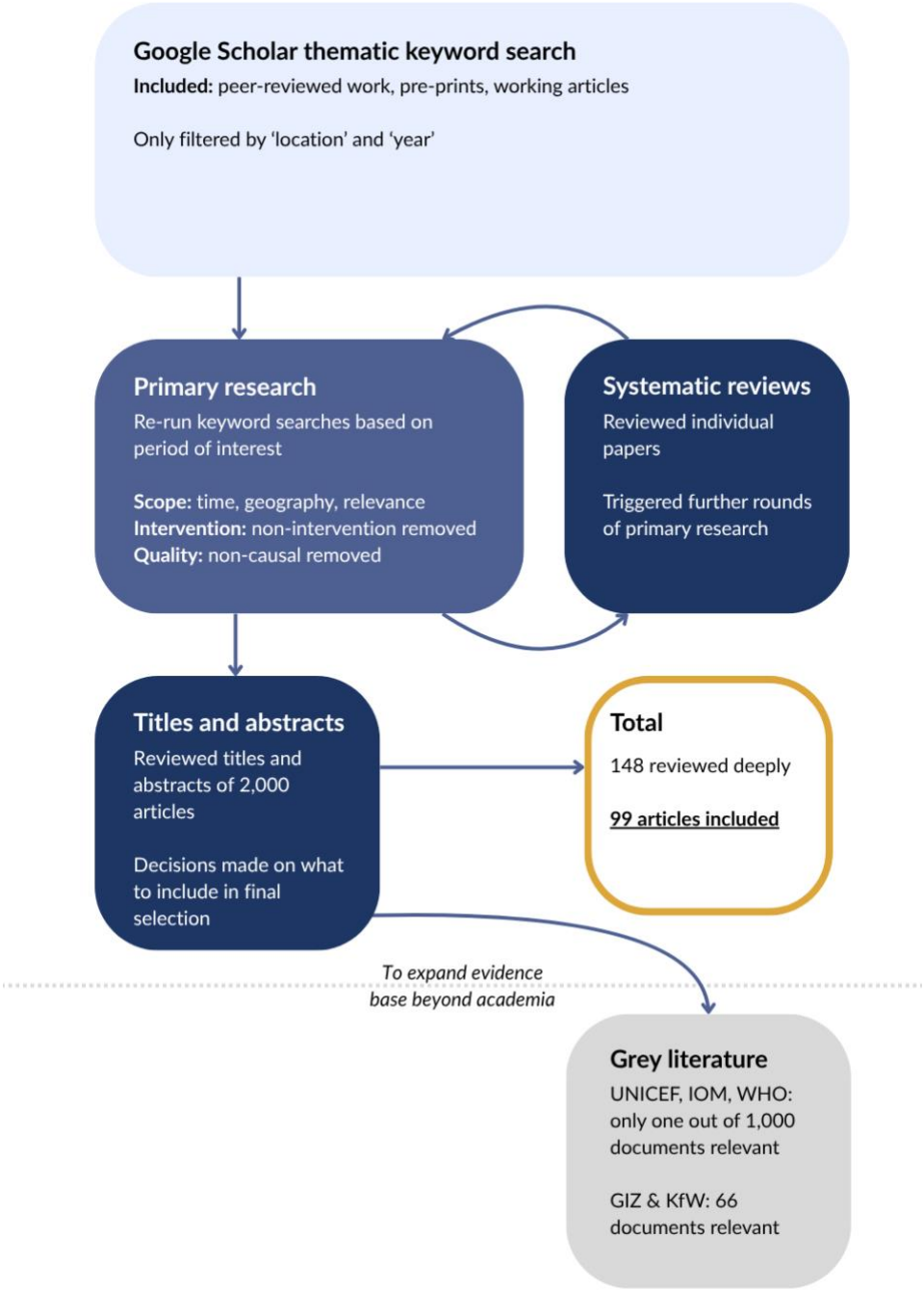

Figure 3: Description of approach to literature search

3. Review of Studies

Despite the broad search strategy used to identify both causal and non-causal literature, the subsequent scope and relevance criteria reduced a longlist of well over 3000 documents to less than 200 in total, across the thematic areas of interest to this study. In some areas, such as WASH, a reasonable number of studies were identified, whereas in others only a small number of relevant evaluations were found. Consequently, in several cases the available evidence for a specific input-impact relationship relies on a very limited number of studies. The findings presented below should therefore be interpreted in the context of a relatively small and uneven evidence base.

This work reveals a number of findings and associated knowledge gaps that are common across the areas of focus that stem from the relative lack of both causal and non-causal documentation. In particular, we find that the major bulk of evidence arises from short-term understandings of impacts on access to, quality of and satisfaction with infrastructure. Here, effects tend to be positive. By contrast, there is significantly less evidence on whether or not these positive outcomes extend to the long-term. Similarly, while there is some, albeit much less, evidence for positive impacts at the outcome level, indicators beyond that outcome level (e.g., of "peacefulness"), that might capture a reduced risk of future crisis are broadly absent from the literature.

Despite this, however, the reviews uncover causal evidence of the positive impacts that infrastructure programming can have in reconstruction settings, across multiple thematic areas. We discuss these area-specific outcomes in the sub-sections below. These sections are sub-divided according to the classifications of the intervention or input as either directly related to the provision of Infrastructure, interventions related to the use of physical infrastructure (Infrastructure+), and the provision of Equipment related to physical infrastructure.

3.1. Economic and Livelihoods Interventions

A large share of development interventions in fragile and conflict-affected contexts aim to improve economic outcomes and livelihoods through investments in physical infrastructure, including irrigation systems, transport networks, ports, agricultural facilities, and public service infrastructure. While some evidence on the impacts of such investments is drawn from both academic studies and evaluations by development agencies, causal and even non-causal quantitative evidence is modest, especially in comparison to the scale of these investments.

Most available analyses rely on qualitative or ex-post programme evaluations rather than experimental or quasi-experimental methods. This pattern is consistent with broader

findings from the literature on reconstruction and development infrastructure in fragile settings (see also: Beber et al., 2025). Similarly, we find little evidence of evaluations focussing more directly on the direct impacts of building infrastructure (e.g., vocational training centres or jobs exchanges) at either the direct or outcome level.

3.1.1. Infrastructure

We identify **no studies that use causally identified experimental or quasi-experimental methods where the primary treatment was the construction of physical infrastructure aimed specifically at improving economic or livelihood outcomes.** As a result, the key insights on the impacts of investments in economic infrastructure rely on qualitative comparative analysis and ex-post programme evaluations.

Some non-causal academic evidence suggests that the **institutional design of infrastructure programmes, particularly the degree of local participation and ownership, plays an important role in shaping economic outcomes.** For example, a comparative qualitative analysis of irrigation infrastructure programmes in Afghanistan examines differences between donor-led and community-oriented approaches to rehabilitating irrigation canals, wells, and water intake facilities (Nagata, 2016). The analysis finds that projects emphasising local ownership and community management produced more sustainable economic outcomes, including higher agricultural incomes, stronger local governance institutions, and greater long-term functionality of irrigation infrastructure. In contrast, more centrally designed donor projects often struggled to achieve comparable sustainability or community engagement. These findings suggest that community-driven approaches to infrastructure development may improve both economic outcomes and institutional sustainability, even when infrastructure investments themselves are similar.

Most evidence on infrastructure-based livelihood interventions comes from ex-post evaluations conducted by development finance institutions, particularly the German development bank KfW and the German development agency GIZ. These evaluations typically rely on mixed methods approaches combining document analysis, stakeholder interviews, and descriptive indicators rather than experimental or quasi-experimental designs. Several of these evaluations also focus on irrigation and rural infrastructure investments aimed at improving agricultural production and associated livelihoods. For example, ex-post evaluations of **irrigation and rural development programmes report increases in irrigated land and improved agricultural production potential**, enabling farmers to cultivate higher-value crops and expand production (KfW, 2016b). In some cases, these programmes were associated with higher commercialization of agricultural output and modest income gains among participating households. However, evaluations

also note that impacts on agricultural yields and food security are often difficult to measure conclusively.

Transport infrastructure investments represent another common category of intervention. **Evaluations of rural road construction and rehabilitation programmes report improvements in traffic volumes, reduced transport costs, and shorter travel times,** which can facilitate agricultural marketing and improve access to services (KfW, 2016a). These programmes also generate temporary employment during construction and may contribute to broader regional economic development. However, sustainability challenges were frequently highlighted, particularly where road maintenance systems are weak.

Evidence from large-scale transport infrastructure projects is more mixed. Evaluations of **port and logistics infrastructure investments indicate improvements in operational efficiency, such as reduced docking times and expanded capacity, although utilization rates and financial sustainability sometimes remain below expectations** (KfW, 2017c).

A number of infrastructure programmes in fragile and conflict-affected contexts adopt labour-intensive public works approaches, combining infrastructure rehabilitation with short-term employment generation. Evaluations of these programmes suggest that they **can provide temporary income support and reduce negative coping strategies among vulnerable households, although long-term employment effects tend to be limited** (KfW, 2019a). Evidence from GIZ programmes similarly highlights the role of integrated economic development approaches that combine infrastructure investments with institutional and market development support. For example, renewable energy programmes promoting biodigester installation through market-based financing mechanisms have expanded access to renewable energy technologies and supported the development of local value chains (Wirnitzer et al., 2024). Rural development and value chain programmes combining irrigation investments with advisory services and financial access have also generated income gains for some participating farmers and enterprises (Raetzell & Ahmed, 2024). In addition, programmes supporting youth employment and vocational training reform have created employment opportunities and increased incomes for programme participants, although implementation challenges and institutional constraints remain important risks to sustainability (Wirnitzer et al., 2024).

Overall, the literature on infrastructure-based economic and livelihood interventions is dominated by descriptive evaluations rather than causal impact studies. These evaluations consistently report **improvements in infrastructure access, agricultural productivity potential, and short-term employment opportunities, although evidence on their long-term economic impacts remains limited.** The available evidence suggests that infrastructure investments can contribute to **improved market access, agricultural**

production, and local economic activity, particularly when combined with complementary interventions such as training, financial services, or institutional support. However, sustainability challenges - including weak maintenance systems, institutional constraints, and broader economic instability - often limit the long-term development impact of these investments.

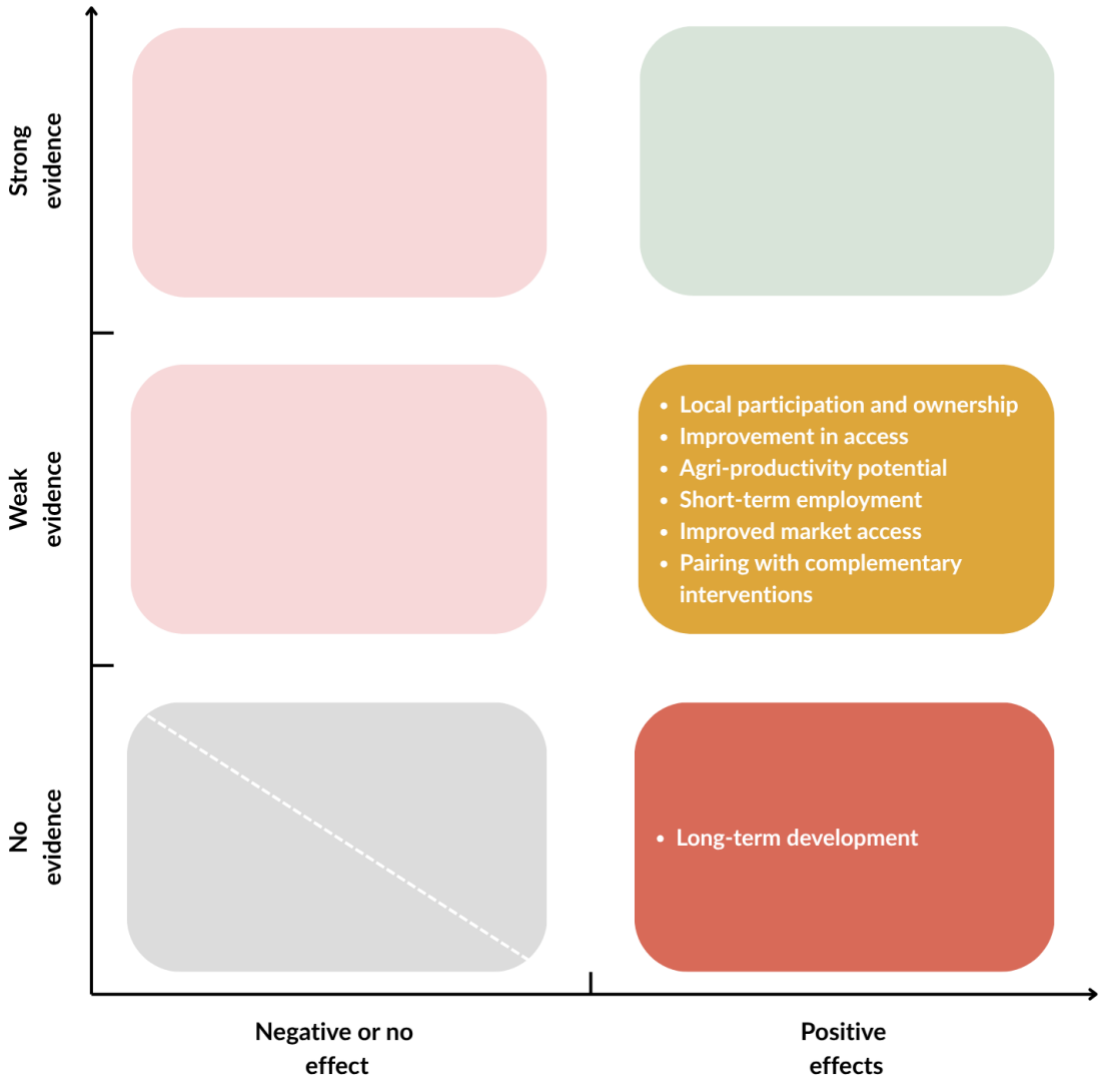

Figure 4: Economic and Livelihoods Infrastructure Interventions Findings (colour indicates strength of evidence) (25 sources included)

3.1.2. Infrastructure+

Rigorous causal evidence on infrastructure-related interventions and economic outcomes is also limited. However, a substantial body of experimental research examines interventions that provide training, skills development, or equipment intended to improve livelihoods, employment, or business performance, although we note that this does not, necessarily, directly pertain to infrastructure. Most of this literature uses individual or cluster randomised controlled trials, often focusing on youth, small business owners, or farmers. The basis for including this in the literature review is that a lot of these programs would not be possible without physical infrastructure to support it. That is, for example, TVET would not be possible without, first, creating TVET training centres. Accordingly, efforts to improve the quality of teaching at a TVET center would be comparable, for example, to training that is relevant to the use of WASH infrastructure. We first focus on learning around investments in interventions directly related to infrastructure interventions, before turning to the interventions that would not be possible without physical infrastructure but are less directly linked to infrastructure interventions.

For the direct investments in infrastructure-related interventions, quasi-experimental evidence comes from an evaluation of the Community Conflict Resolution (CONCUR) programme in Nigeria, which combined community mediation and dialogue mechanisms with efforts to manage shared local physical resources (Wolfe, 2017). Compared to comparison communities, households in CONCUR sites reported greater reductions in community tensions and increases in freedom of movement, as well as improved dispute resolution and management of shared resources. The programme was also associated with improvements in perceived economic stability, but these changes were not accompanied by measurable improvements in objective economic indicators. Income grew, access to work opportunities improved, and investments in productive assets increased in both intervention and comparison communities, but there were no statistical differences between the groups. This suggests that **infrastructure-related or community resource management interventions may improve perceptions of economic security and stability without necessarily generating short-term improvements in measurable economic activity.**

Several RCTs evaluate vocational training programmes designed to improve employment outcomes, with mixed results. Evidence from Uganda shows that training can generate positive labour market outcomes when combined with complementary interventions. In a multi-arm RCT, Bandiera et al. (2023) find that training combined with labour market matching services produces stronger improvements in employment, income, and job quality than either training or matching alone. However, the programme does not

significantly affect cognitive ability or individuals' self-evaluation of skills. Similarly, an RCT of the Mafita programme in Nigeria, which provides apprenticeships and community-based skills training for marginalised youth, finds substantial positive labour market effects (Crawford et al., 2021). Participants were more likely to be employed or self-employed, spent more time in income-generating activities, and reported higher profits, asset ownership, and consumption expenditure. The programme also increased job search behaviour and business creation attempts. Beyond economic outcomes, the programme improved subjective wellbeing, expanded professional networks, and strengthened support for women's empowerment. However, it had no measurable effects on antisocial behaviour, political violence, or participation in riots.

Evidence from Sierra Leone during the Ebola crisis similarly suggests modest economic gains from integrated support programmes. A multi-arm RCT combining cash transfers with different forms of business and technical training finds small but positive effects on employment, profits, and business creation of cash and training compared to just cash (Rosas et al., 2021). Importantly, programme impacts vary across individuals depending on their initial skill levels. Participants with stronger initial skills experienced better labour market outcomes and entrepreneurship effects, while those with weaker non-cognitive skills primarily increased consumption after participating in the programme.

Other studies show weaker or more limited impacts. An RCT of long-duration vocational training in Nepal finds little evidence of broad economic or behavioural impacts, with the only significant effect being higher employment rates among participants (Shyamal et al., 2024). Notably, effectiveness depended strongly on participant selection: when trainers selected trainees rather than relying on random assignment, programme impacts were approximately 50 percent larger. Similarly, an RCT examining vocational training programmes in Afghanistan finds that prolonged classroom-based contact between different social groups during training does not improve intergroup attitudes or behaviours, raising questions about whether or not vocational programmes alone are sufficient to generate broader social or relational change in conflict-affected settings (Zhou and Lyall, 2024).

Overall, the RCT evidence suggests that **vocational training programmes can generate labour market improvements, particularly when paired with complementary interventions such as job matching, business support, or financial assistance.** However, standalone training programmes often produce modest or inconsistent effects, and **programme design, including participant selection and complementary services, appears to play an important role in determining effectiveness.**

Another set of RCTs evaluates entrepreneurship and business training interventions aimed at improving firm performance. An RCT among high school students in Uganda found that participation in the SEED programme, a school-based mini-MBA focusing on both business and soft skills, significantly increased entrepreneurial activity (Chioda et al., 2021). Participants showed improvements in intra-personal and interpersonal skills and were more likely to start businesses, generate profits, and expand firm size. Similarly, an RCT among small business owners in Liberia found that both business skills training and customer-focused soft skills training increase firm profits and sales (Dammert and Nansamba, 2023). Soft-skills training in particular generates larger effects on investments, diversification of goods and services, and the likelihood of starting additional businesses. Interestingly, combining both training types does not further increase profits or sales, though it improves progress toward longer-term business goals.

Together, these studies suggest that **entrepreneurship training can improve business outcomes** in highly fragile settings, particularly when it strengthens both managerial capabilities and behavioural skills such as customer relations and goal setting. However, questions remain about how directly linked to infrastructure such interventions are.

Experimental evidence also exists for training programmes aimed at improving agricultural productivity. A multi-arm RCT in Ethiopia evaluating Comprehensive Competence-Based Training for smallholder farmers found that participants developed stronger theoretical and practical agricultural skills, which translated into higher crop yields (Tarekegne et al., 2023). Both low- and high-intensity training improved outcomes, though effects were larger for farmers receiving more intensive training.

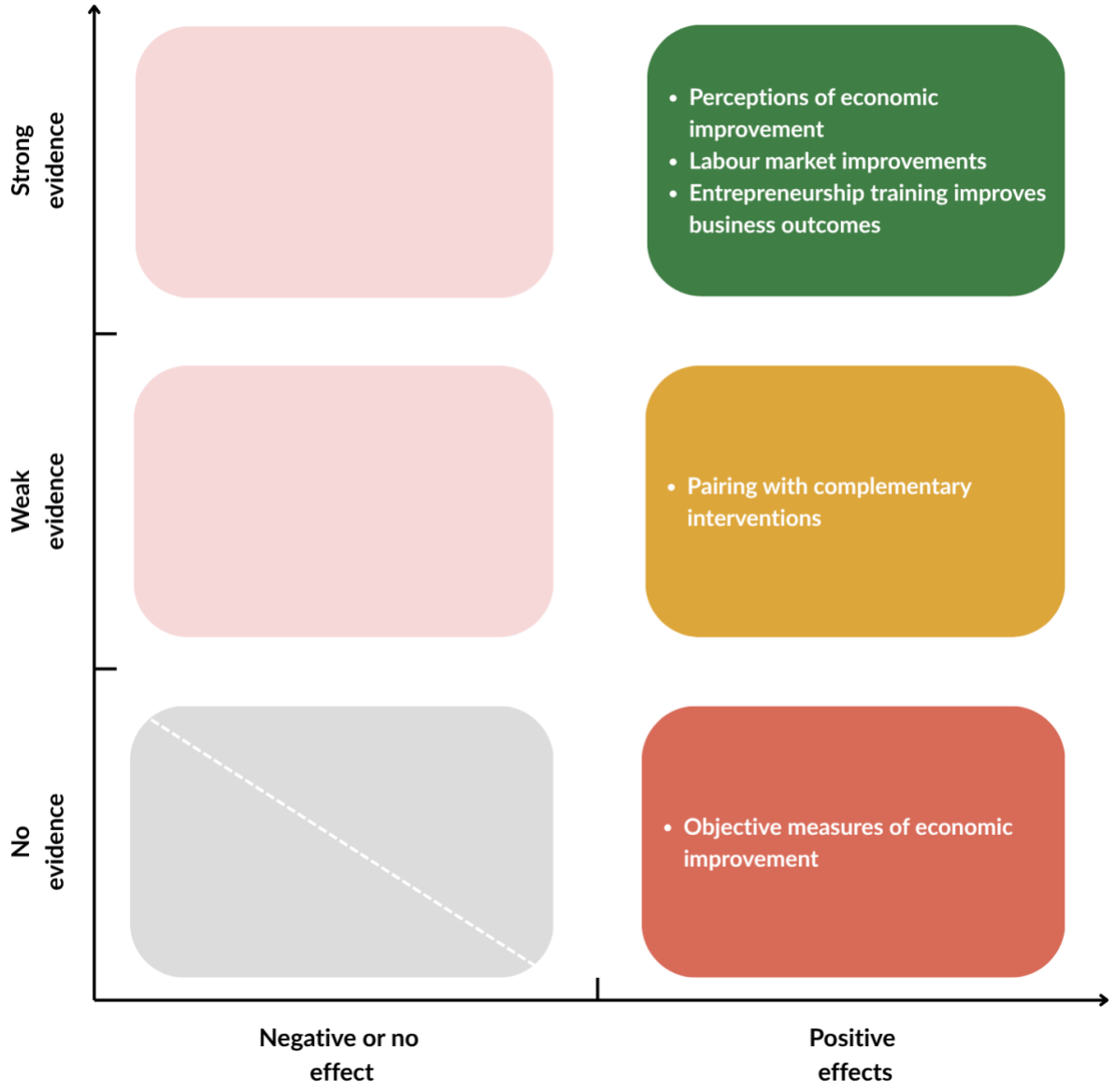

Figure 5: Economic and Livelihoods Infrastructure+ Interventions (18 sources included)

3.1.3. Equipment

Evidence on interventions providing productive equipment or agricultural inputs exists, but it is generally limited and non-causal. One exception is a multi-arm individual-level RCT in Uganda evaluating Creative Capacity Building training aimed at encouraging farmers and entrepreneurs to design and develop locally appropriate technologies (Nikonya et al., 2019). The programme improved participants' ability to design technical solutions and strengthened business management practices. However, it produced only

limited short-term effects on conventional economic indicators such as income or asset accumulation. This suggests that **innovation and creativity training may first influence behavioural practices and problem-solving approaches before translating into measurable economic gains.**

Another programme in Uganda combined **agricultural training with the provision of tools and equipment** such as storage technologies, fencing materials, and post-harvest machinery (Ikendi et al., 2024). Evidence from cross-sectional comparisons between trained and untrained households suggests that participants were more likely to adopt improved farming practices, cultivate nutrient-dense crops, and use better storage techniques. These changes were associated with **improvements in food security and household empowerment.**

Finally, a community-based RCT in the Democratic Republic of Congo examined a programme combining microfinance training with the provision of livestock assets (pigs) to rural households (Kohli et al., 2017). The intervention aimed to improve economic stability while also addressing social and psychological wellbeing. The evaluation found **improvements in household economic stability and broader indicators of resilience,** including family relationships and community engagement. This matches longer-held understandings that providing "capital" might be key to improving the effectiveness of livelihoods programming in fragile settings (e.g., Blattman and Ralston, 2014).

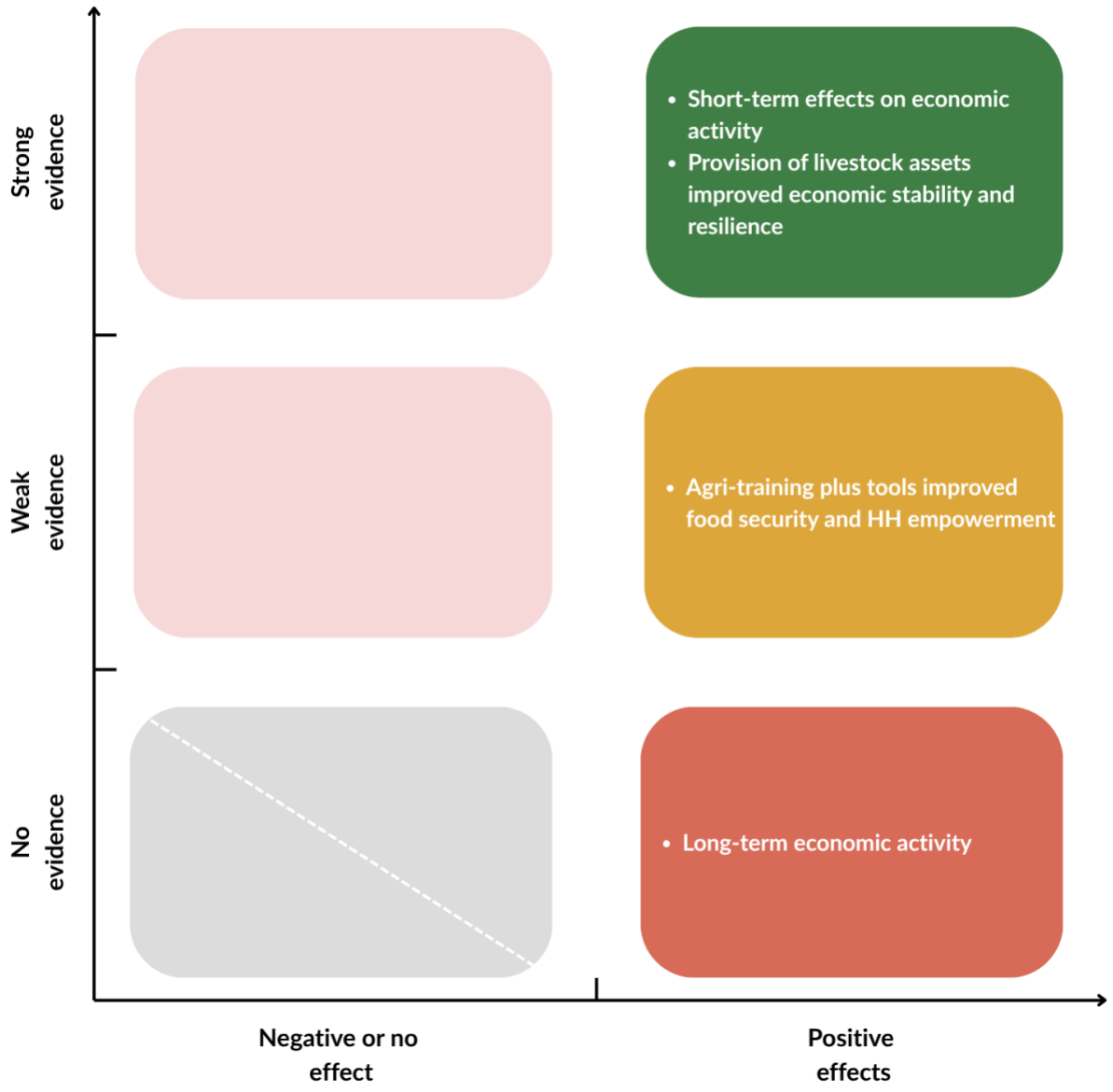

Figure 6: Economic and Livelihoods Equipment Interventions (4 sources included)

3.1.4. Summary of Findings and Gaps

Across the literature, several common patterns emerge. The first is that few rigorous, causal, studies examine the role of providing economic infrastructure. This is, perhaps, not surprising. The building or rehabilitation of infrastructure like a port or road, for example, is ill-suited to the methodological requirements of such studies. However, it is perhaps less clear why comparatively few studies consider, for example, the role of building training centres or job exchanges. In this regard, we mostly rely on non-causal information

to assess the extent of knowledge in such areas. While the potential of building infrastructure to create jobs appears to be something of a knowledge gap, therefore, the reasons for this are understandable and it is unclear how these limitations could be overcome. The second is that, perhaps uniquely to livelihoods interventions, a question emerges about the point at which "training" connects to infrastructure. For example, vocational training relies on infrastructure (e.g., training centers) in the same way that WASH training relies on WASH infrastructure. Yet the training provided does not pertain to the use of the infrastructure, but rather to broader skills development. Accordingly, an ambiguity arises about the extent to which vocational training, itself, can be considered a reconstruction intervention. We include this information on the principle of including rather than excluding interventions that are on the margin.

We find little evidence of studies – causal or otherwise – that focus either on training to improve the efficacy of such centers (e.g., the training of instructors) or on the use of these facilities (e.g., the training of individuals on the usefulness of such training) in highly fragile settings. Such trainings might be a more direct and appropriate analogue of the Infrastructure+ interventions considered in the other thematic areas.

The studies reviewed generally show that skills and training interventions often produce measurable improvements in employment, entrepreneurship, or productivity, particularly when programmes combine training with complementary support such as job matching, financial assistance, or business development services. Many of these programs rely on, or are enabled by, secure physical infrastructure and are therefore included in the review. Programme impacts frequently vary across participants, with stronger effects observed among individuals who already possess higher levels of skills or motivation.

Interventions providing equipment or productive assets alone tend to generate weaker or slower economic impacts, particularly when they are not paired with training or capacity development. In many cases, such programmes need to influence behavioural practices or perceptions before translating into measurable economic outcomes. Overall, the strongest evidence suggests that integrated livelihood interventions – combining training, resources, and institutional support – are more likely to generate sustained economic benefits than standalone interventions focused solely on equipment provision or classroom-based training.

3.2. Water, Sanitation and Hygiene (WASH)

The body of research clearly demonstrates that there are some areas in which strong evidence has been generated around the impact of WASH infrastructure in highly fragile settings; and other areas where there is some valuable, but weaker, evidence. We discuss

these areas in the subsections below, Infrastructure and Infrastructure+, before reflecting on the key knowledge gaps that emerge.

3.2.1. Infrastructure

The most consistent finding, supported by multiple studies, is that **investments in WASH infrastructure improve access to water and sanitation services for the intended beneficiaries of the investment.** Evidence from large-scale programmes and community-driven initiatives suggest that infrastructure interventions increase the availability of and access to improved water sources, sanitation facilities, and related utilities. In many cases, **associated improvements in perceptions of quality and satisfaction with services is also noted.** For example, the National Solidarity Program in Afghanistan significantly improved village access to drinking water and electricity (Beath et al., 2015). Similarly, a cluster-randomised trial of the Healthy Villages and Schools programme in the Democratic Republic of Congo found substantial increases in access to improved water sources and sanitation facilities, alongside stronger local water governance institutions and improved WASH practices (Quattrochi, 2021).

Evidence from case study and programmatic analyses points to similar outcomes. Long-term WASH investments in Somalia improved access to sanitation and water services while strengthening local governance structures and resilience to environmental and conflict-related shocks (Datta et al., 2025). Overall, these studies suggest that infrastructure interventions reliably achieve their primary objective of expanding access to WASH services, even in highly fragile environments.

However, **improvements in infrastructure access do not necessarily translate into broader outcomes**, such as those related to health. In the DRC evaluation, for example, increased access to improved water and sanitation did not lead to measurable reductions in diarrhoeal disease or improvements in child growth indicators (Quattrochi, 2021). This suggests that infrastructure provision alone may be insufficient to generate health gains without complementary improvements in hygiene practices or environmental health conditions. This suggests a potential for a key role in pairing training on the use of the infrastructure with its provision, for example.

A second finding emerges from literature seeking to understand market-based approaches to WASH uptake. Here, the evidence suggests that **supply-side interventions alone, like providing important equipment, may struggle to generate sufficient demand for improved sanitation technologies.** For example, an intervention in rural Kenya introduced plastic latrine slabs designed to upgrade traditional pit latrines, alongside marketing campaigns and efforts to engage community leaders and financial intermediaries (Peletz et al., 2019). While the intervention improved awareness and perceptions of the product,

demand remained subdued and willingness to pay was below the market rate. Accordingly, market-based distribution models may face important liquidity constraints in highly fragile settings and alternative approaches, such as public subsidies, financing mechanisms, or stronger demand creation efforts may be required.

Quasi-experimental studies additionally suggest that **WASH infrastructure interventions can strengthen community participation and governance structures.** For instance, a community-based WASH programme in Sierra Leone that constructed boreholes and water kiosks, and provided training to youth groups increased community awareness of water and sanitation issues and participation in WASH activities (Vonk et al., 2022). Communities that received new water infrastructure reported greater confidence in managing water services and maintaining facilities, a key common resource. These findings are consistent with other evidence indicating that participatory WASH programmes can build local capacity and governance structures.

Another recurring finding is that **improved water infrastructure does not always generate measurable improvements in health or hygiene behaviour, particularly in the short term.** Evidence from Bangladesh illustrates this pattern. An evaluation of a government piped water supply network found that the intervention improved water storage capacity and reduced time spent collecting water, but did not improve water quality at the point of use or reduce child diarrhoea or malnutrition (Hasan and Gerber, 2016). Similarly, improvements to spring infrastructure in rural Ethiopia significantly increased access to safe water and reduced household water insecurity but the reduced economic and psychological burden did not result in measurable reductions in women's distress (Stevenson et al., 2016).

Together, these studies suggest that the relationship between infrastructure improvements and downstream welfare outcomes may depend on additional factors, including water treatment practices, hygiene behaviours, and broader environmental conditions. We discuss this potential in the next sub-section.

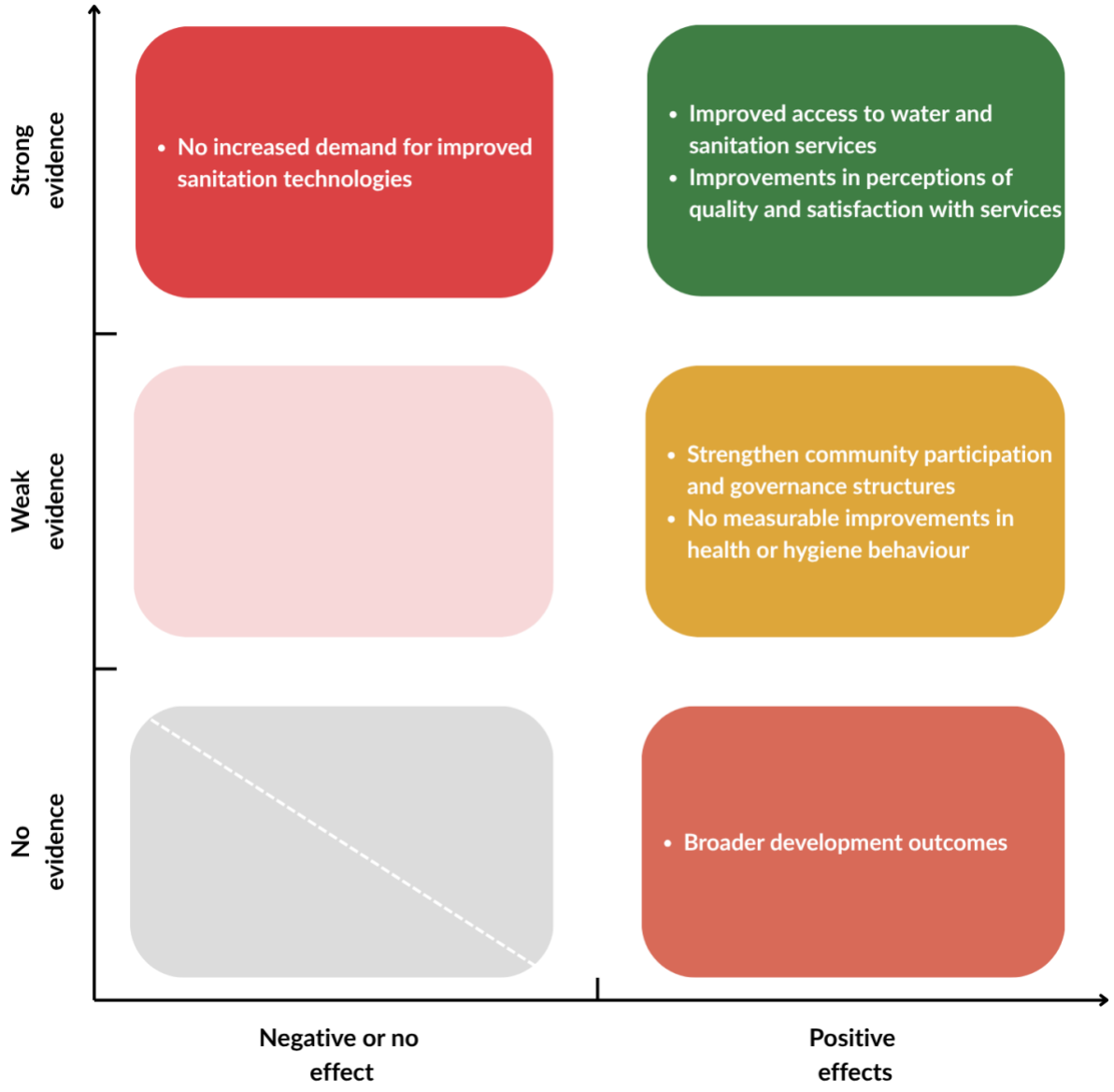

Figure 7: Visualisation of WASH Infrastructure findings (36 sources included)

3.2.2. Infrastructure +

The potential for approaches that pair WASH infrastructure with information is captured, particularly in interventions that pair infrastructure with training, such as interventions that take place in schools. In these settings, WASH infrastructure investments in schools and associated knowledge and capacity development can generate positive outcomes for children's health and school participation. For example, a large matched-control study in Mali found that school-based interventions – including installation of water points and

latrines, provision of hygiene supplies, and hygiene education – reduced reported diarrhoea and respiratory infection symptoms among students and decreased illness-related absenteeism (Trinies et al., 2016). These results suggest that school environments may provide an effective setting for integrated WASH interventions.

Beyond infrastructure provision, a number of non-causal studies and evaluations highlight the importance of information and behavioural interventions in shaping WASH outcomes. In Bangladesh, an information campaign about arsenic contamination led many households to switch away from unsafe wells once contamination was revealed (Tarozzi et al., 2021). Similarly, in a humanitarian emergency setting in Ethiopia, the provision of portable handwashing stations increased reported handwashing behaviour and was widely accepted by displaced populations (Hussain et al., 2015).

These findings suggest that behavioural responses to WASH interventions can be substantial when information or appropriate technologies are provided. However, many studies still focus on feasibility and behaviour change rather than on long-term health impacts. Several studies examine behavioural and institutional interventions designed to complement or improve the use of WASH infrastructure. Evidence suggests that **behavioural programmes alone often have limited health impacts, although they may influence hygiene practices and infrastructure use.** For example, a multi-arm randomised trial of village "health clubs" in rural Rwanda found no impact on diarrhoeal incidence, despite a reduction in reported cases in absolute terms (Sinharoy et al. 2017). By contrast, **targeted behavioural interventions focused on the management of shared sanitation infrastructure show more promising results.** A randomised trial in Uganda found that facilitated discussions and commitment mechanisms among users of shared facilities improved cleaning and maintenance behaviour, suggesting that collective approaches may improve the functionality of shared sanitation systems (Tumwebaze & Mosler, 2015).

A related body of work examines the social, institutional, and economic factors influencing demand for sanitation services and infrastructure investment. In Kenya, experimental willingness-to-pay scenarios for sanitation services suggest that trust in service providers is a key determinant of a households' willingness to contribute financially to sanitation systems, outweighing factors such as messaging about environmental or health benefits (Acey et al., 2019). Qualitative findings from the same study also highlight the role of perceived fairness in cost sharing, with respondents expressing support for progressive contribution structures in which wealthier households and industries bear a larger share of sanitation costs.

Evidence also highlights the **importance of institutional enforcement mechanisms in sustaining infrastructure financing and service delivery.** A large-scale field experiment in

informal settlements in Nairobi found that information-based engagement strategies, such as phone calls, site visits, and SMS messages explaining water billing, had no significant effect on payment behaviour for water and sewer services. However, formal disconnection notices led to sharp increases in payment compliance, indicating that enforcement measures may be more effective than information campaigns in improving revenue collection for water and sanitation utilities (Coville et al., 2020).

Finally, some interventions combine infrastructure provision with behaviour change and community engagement strategies. In Bangladesh, programmes integrating hygiene promotion, water quality information, and local institutional engagement with schools and community committees were associated with improvements in WASH practices, including increased water storage and handwashing after farming activities and before food preparation (Malek et al., 2016). However, while the intervention influenced behaviour, impacts on health outcomes were mixed: diarrhoeal prevalence declined modestly in some treatment arms but remained higher relative to controls in others, and no effects were observed on child anthropometric indicators. Overall, the findings suggest that **behavioural and institutional interventions can improve the use and management of WASH infrastructure, but their effects on health outcomes are less consistent.**

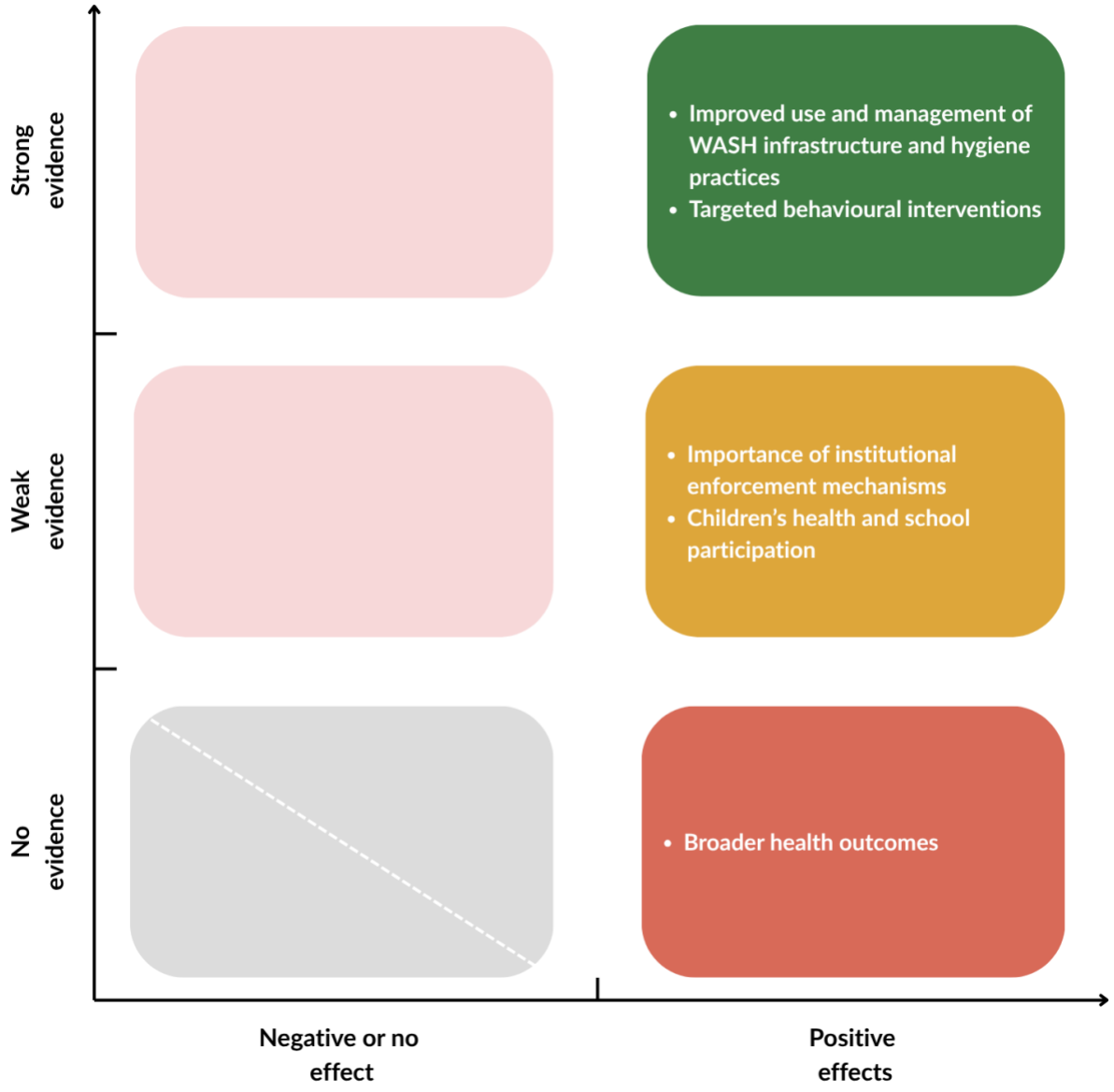

Figure 8: WASH Infrastructure+ Findings (12 sources included)

3.2.3. Equipment

A substantial body of experimental evidence examines the provision of hygiene-related equipment and household-level water treatment technologies, often combined with behaviour change interventions. We observe that relatively simple material inputs (which we include amongst "equipment" as it might be necessary for the infrastructure to work as intended) such as **soap, water treatment products, or menstrual hygiene supplies,**

generate improvements in hygiene behaviour and health outcomes. However, **evidence for sustained use and long-term impacts remains mixed.**

Several studies find clear **health benefits when hygiene inputs are paired with behaviour change messaging.** For example, the provision of soap alongside handwashing promotion significantly reduced diarrhoeal incidence among young children in rural Ethiopia (Solomon et al., 2021). Hygiene education and handwashing promotion interventions reduced childhood diarrhoea in pastoralist communities in eastern Ethiopia (Hashi et al., 2017). Evidence from Bangladesh shows that relatively simple household technologies, such as safe water storage containers and chlorination, can be effective in reducing diarrhoeal prevalence in children under two (Ercumen et al., 2015). Similarly, the distribution of household water filters in Kenya improved drinking water quality and reduced diarrhoea and the need to visit health facilities among young children (Morris et al., 2018). These findings indicate that **low-cost hygiene inputs delivered at the household level can reduce waterborne disease risk**, particularly when contamination occurs during water storage or handling, and could be key to supporting the impacts of infrastructure provision.

Evidence also suggests that **behavioural interventions can improve hygiene practices even when health impacts are not consistently observed**. Participatory handwashing promotion among pregnant women in Bangladesh modestly increased handwashing behaviour around childbirth (Ram et al. 2017). Programmes combining hygiene promotion with agricultural activities, also in Bangladesh, improved several hygiene practices such as water storage and handwashing after farming activities (Malek et al. 2016). However, large multi-arm trials integrating WASH behaviour change with nutrition interventions have found no significant reductions in diarrhoeal prevalence, highlighting the limits of behaviour change alone (Null et al., 2018).

A related set of studies focuses on sanitation adoption and household investment in sanitation technologies. Evidence suggests that **financial constraints are a major barrier to adoption.** A cluster randomised trial in Bangladesh found that targeted subsidies for hygienic latrines increased ownership by around 22 percentage points, while community mobilisation and supply-side market improvements alone had little effect on adoption (Guiteras et al., 2015). Community-level behaviour change programmes such as Community-Led Total Sanitation (CLTS)[10] can increase latrine construction and reduce open defecation, but the magnitude of health impacts appears modest and depends on the level of sanitation adoption achieved (Pickering et al., 2015).

[10] "In this approach, communities are facilitated to take collective action to adopt safe and hygienic sanitation behavior and ensure that all households have access to safe sanitation facilities". (World Bank,

Other studies highlight the **challenges of sustaining adoption and long-term use of hygiene technologies.** In Bangladesh, commitment-based behaviour change interventions initially increased switching away from arsenic-contaminated wells, but switching rates declined over time after support ended (Inauen & Mosler, 2015). Similarly, trials distributing water disinfection tablets and safe storage containers found high initial adoption, but usage fell substantially over time (Pickering et al.). These findings suggest that continued engagement or reinforcement may be required to maintain behavioural changes associated with household WASH technologies.

Finally, some studies examine hygiene-related equipment targeted at specific populations, particularly school-aged girls. In Kenya, providing menstrual cups or sanitary pads alongside hygiene education reduced the prevalence of reproductive tract infections and sexually transmitted infections (Phillips-Howard et al., 2016). School-based programmes providing puberty education and reusable sanitary pads in Uganda were associated with smaller declines in school attendance compared with control schools, although effects on psychosocial outcomes such as shame or insecurity during menstruation were limited (Montgomery et al., 2016). However, not all equipment interventions generate measurable impacts. For example, the provision of antimicrobial hand towels and associated training in Kenya showed no measurable effects on hygiene or health outcomes (Slayton et al., 2016).

Overall, the literature suggests that **household-level hygiene equipment and water treatment technologies can improve hygiene behaviour and sometimes reduce diarrhoeal disease, particularly when paired with behaviour change messaging.** Such findings could be key in linking WASH infrastructure interventions with key outcome level impacts (e.g., prevalence of infection diseases) that are, often, not observed to arise when infrastructure is provided in isolation. The evidence also highlights **persistent challenges around sustained adoption, financial barriers to sanitation investment, and the difficulty of translating behavioural improvements into consistent health gains** that could, however, provide challenges to such approaches.

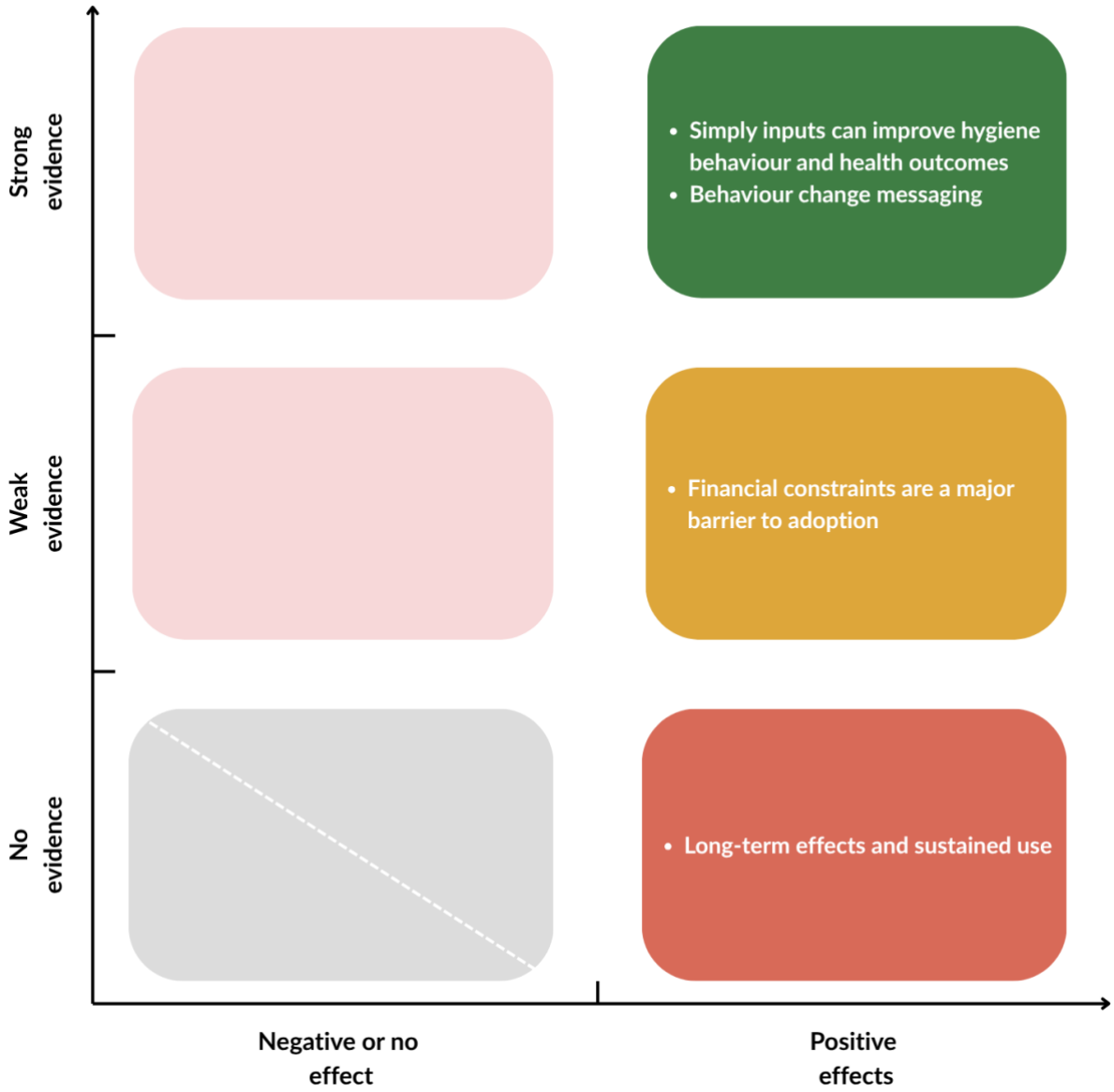

Figure 9: WASH Equipment Findings (14 sources included)

3.2.4. Summary of Findings and Gaps

At a high level, we find a number of studies that rigorously evaluate the provision of WASH infrastructure and related interventions in reconstruction settings, although this remains small in comparison to the broader body of literature on the impact of WASH interventions. In spite of this, we find a number of studies that have been conducted and that key evidence, both of what is known and what is not, is uncovered. Across major

WASH infrastructure types (e.g., building wells, latrines and piped water systems), activities tend to be associated with improved access and use of such facilities. This provides strong evidence that the provision of WASH infrastructure in reconstruction settings is associated with a greater quality of WASH provision and access. This provides evidence that WASH reconstruction can deliver impacts on direct outcomes. A key limitation, however, is that most effects are only studied in the short-term (<3 months) aftermath of infrastructure provision. This opens questions about the longer-term aftermath and the sustainability of both the infrastructure and of these positive effects. Similarly, in general we find positive impacts of efforts to provide equipment (broadly defined), such as soap, in that it can support the aims of the infrastructure provision.

While these findings are positive, there is significantly less evidence that links WASH infrastructure to broader outcome level indicators, particularly health outcomes. This is somewhat surprising, as such outcomes are logically connected to improvements in service access and quality. The literature provides some indications that complementary interventions, particularly training, play an important role (e.g., in Trinies et al., 2016). Given the limited evidence that WASH infrastructure alone improves health-related outcomes, (e.g., Quatrrochi, 2021; Hasan and Gerber, 2016), it is possible that complementary programme components are necessary to realize the full benefits of these investments. Training and behavioral interventions may therefore be critical for unlocking the wider potential of WASH infrastructure. Addressing these gaps should be a priority for future research, particularly in reconstruction and highly-fragile settings.

3.3. MHPSS, Health and Education

Although the themes of MHPSS, Health and Education are diverse, we group them together for three main reasons. First, they broadly relate to the provision of social services to target populations. Second, both the direct outcomes (access, quality and satisfaction) and the outcome level impacts (health outcomes, mental health outcomes, and education outcomes) are closely and directly linked to the underlying infrastructure. Third, and perhaps surprisingly, our review identifies comparatively few impact evaluations of infrastructure interventions of this kind in highly fragile places.

2.3.1. Infrastructure

Perhaps surprisingly, our review uncovered no rigorous impact evaluations of health, MHPSS or education infrastructure in highly fragile places, even for relatively basic outcomes such as access to or quality of services. This is a key knowledge gap, as lessons that could be learned in more stable settings might not apply in the highly fragile settings that require reconstruction support. The nature of trauma from past experiences, for example, might require specific inputs that can't be generalised from other settings.

Similarly, the demand side could be affected, both, by such experience of traumas, as well as from the setting (e.g., fear of travelling to facilities, changes in time preferences and changes to anticipated returns from such activities). Accordingly, while a body of evidence is available in more general development settings, caution is urged in applying this directly to reconstruction settings.

The available evidence on infrastructure interventions in the health, education, and mental health and psychosocial support (MHPSS) sectors are limited to programme evaluations conducted by KFW. None of the six studies examined employ experimental or quasi-experimental identification strategies; instead, they rely on ex post evaluations of implemented projects. Consequently, while these evaluations provide valuable insights into programme implementation and outcomes, they cannot establish causal impacts.

The available evidence in the health sector primarily concerns programmes that combine reconstruction of health infrastructure with basic service delivery and public health campaigns. One example is a KFW programme implemented in the Central African Republic (2016b) targeting sexually active individuals within health facility catchment areas. In the context of widespread conflict-related destruction, the programme rehabilitated 94 health facilities and combined infrastructure support with equipment provision, community-level health workforce development, and behavioural interventions. Villagers were trained as nursing assistants, while youth centres were supported to provide reproductive health education. The programme also implemented a condom distribution system and "social marketing" campaign, aiming to promote safer sexual behaviour. The evaluation suggests that these combined measures helped re-establish access to basic health services in areas where facilities had previously been destroyed or rendered non-functional. More broadly, these findings illustrate how **infrastructure reconstruction, workforce training, and public health campaigns can operate together to restore basic health service provision in conflict-affected settings.**

Education infrastructure reconstruction is also significantly disrupted by conflict. Interventions typically involve the construction or rehabilitation of school facilities, often alongside improvements in water, sanitation, and administrative capacity. Several evaluations examine education infrastructure investments in Palestine. A programme evaluated in 2016 focused on constructing and refurbishing classrooms, sanitary units, libraries, sports facilities, and computer laboratories in schools across Gaza and the West Bank (KfW, 2016b). The ex-post evaluation reports that the programme reduced overcrowding in schools, improved access to education, and generated temporary employment, while the infrastructure itself remained functional several years after project completion. The evaluation also suggests that the **improved school environment may**

have contributed to local stabilisation effects, though this interpretation is based on descriptive evidence rather than causal analysis.

Education infrastructure investments were also implemented in Yemen, where schooling systems were heavily disrupted by conflict. A 2019 evaluation assessed large-scale rehabilitation and construction of education infrastructure, including classrooms, sanitation facilities, water tanks, administrative buildings, libraries, and laboratories. The programme succeeded in maintaining and expanding access to schooling during an increasingly intense civil war, demonstrating the role of infrastructure investments in sustaining education systems under conflict conditions (KfW, 2019). Another KFW programme in Yemen (2017) focused on expanding and rehabilitating school infrastructure for children aged 6–14, with particular emphasis on improving access for girls. The evaluation finds that the **programme successfully expanded school access, particularly for girls, prior to the escalation of the conflict.** However, it **did not produce measurable improvements in learning outcomes**, and the subsequent deterioration of the conflict environment undermined sustainability, as schools were damaged or closed and teachers went unpaid.

None of the evaluations reviewed focused directly on stand-alone mental health and psychosocial support (MHPSS) infrastructure. However, some of the investments described included components that contributed to psychosocial well-being. For example, the rehabilitation of schools and the construction of sports facilities in Palestine created spaces for education, recreation, and community interaction (see also KfW, 2021). Similarly, youth centres supported through the health programme in the Central African Republic provided reproductive health education and social engagement opportunities for young people. While these components may have psychosocial benefits, the evaluations do not directly measure mental health or psychosocial outcomes, and therefore their effects in this area remain largely inferred.

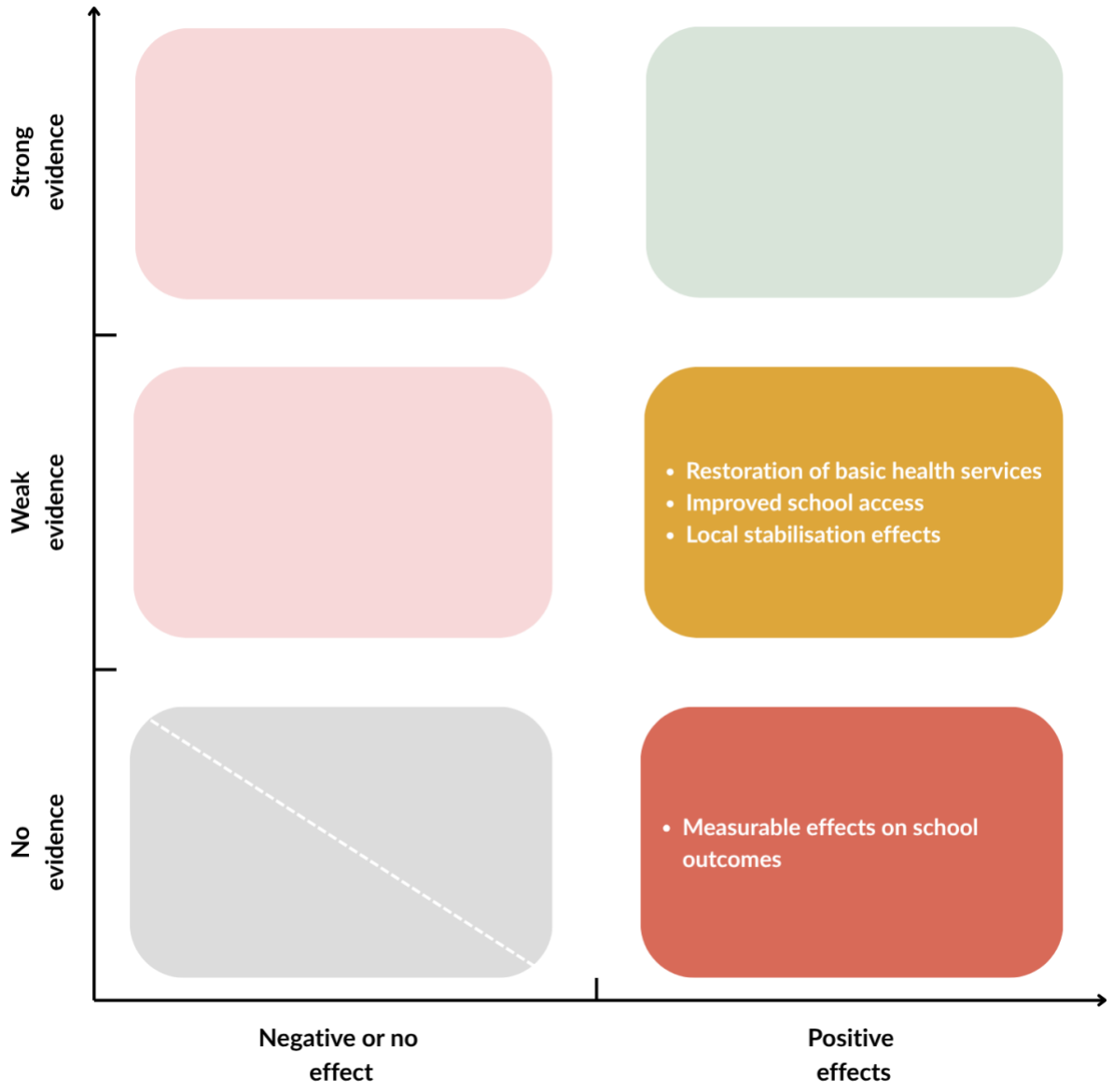

Figure 10: MHPSS, Health and Education Infrastructure Interventions (6 sources included)

3.3.2. Infrastructure+

A number of studies examine interventions delivered within infrastructure relevant to these themes. In these cases, infrastructure functions primarily as the delivery platform for programmes. The evidence base includes several randomised and cluster-randomised trials, which are discussed first, followed by additional quasi-experimental and non-causal studies. Together, these studies provide useful insights into the type of programs that can

complement physical infrastructure investments and help such projects achieve outcomes beyond their immediate objectives.

Several randomised control trials evaluate MHPSS interventions delivered through existing service platforms such as primary health centres, community programmes, or school settings. Weiss et al. (2015) present a randomised, parallel, wait-list control trial conducted in Iraq among survivors of torture and militant attacks. The interventions - Common Elements Treatment Approach (CETA)[11] and Cognitive Processing Therapy (CPT)[12] - were delivered through primary health centres. The results show **large improvements for the CETA intervention across trauma, anxiety, depression, and functional impairment** relative to the control group. CPT produced moderate improvements in trauma and depression but did not significantly reduce anxiety or functional impairment. Similarly, Rahman et al. (2016) conducted a randomised control trial in Pakistan involving adults experiencing psychological distress who sought care at primary health centres. Lay health workers delivered a five-session intervention including problem solving, behavioural activation, stress management, and strengthening of social support. After three months, participants receiving the intervention had **significantly lower anxiety and depression scores** than those receiving enhanced usual care. The intervention also generated significant improvements in post-traumatic stress symptoms, functional impairment, and problem resolution.

Several cluster-randomised trials examine interventions delivered through school systems, targeting both educational and psychosocial outcomes. In the Democratic Republic of Congo, Aber et al. (2016) evaluated a teacher professional development programme designed to improve children's academic skills and socio-emotional development. The programme **increased students' perceptions of their schools and teachers as caring and supportive,** and schools with stronger perceptions of support subsequently exhibited **higher mathematics scores, reduced victimisation, and fewer mental health problems.** These findings suggest that improvements in classroom climate can generate both academic and psychosocial benefits. Related evidence is provided by Torrente et al. (2015), which evaluated a multi-component programme including teacher professional development, community mobilisation, and small grants to support school improvement plans. The programme had **positive effects on students' perceptions of supportive school environments, although it reduced perceptions of predictability and cooperation among**

[11] "CETA is a cognitive-behavioral, modular, flexible, multi-problem, transdiagnostic treatment model that was developed based on advances in high-income settings and built specifically for implementation in LMICs with lay providers" (Murray et al. 2020)

[12] "CPT is a specific type of cognitive behavioral therapy that has been effective in reducing symptoms of PTSD that have developed after experiencing a variety of traumatic events including child abuse, combat, rape and natural disasters" (American Psychological Association, 2017)

students. Overall effects on subjective well-being were not statistically significant, though impacts varied across student subgroups.

Miller et al. (2015) conducted a randomised trial among Syrian refugee and Lebanese children in Lebanon, comparing a life-skills programme (I-Deal) with structured recreational activities delivered in safe community play environments. Despite the programme's focus on identity, emotional regulation, and peer relationships, the evaluation found **no statistically significant improvements in psychosocial wellbeing compared with the control group**. The authors suggest that possible explanations include aspects of programme design, measurement challenges, and ceiling effects in the outcome measures.

Finally, Falisse et al. (2023) conducted a cluster randomised trial in Burundi and the Democratic Republic of Congo evaluating training for health facility committee members. The training aimed to strengthen facility governance through improved committee organisation, accountability, and management. The study found **positive impacts on accountability and management indices in one setting**, but **no measurable improvements in service access, quality, or utilisation,** indicating that strengthening governance structures within facilities does not necessarily translate into immediate improvements in service delivery.

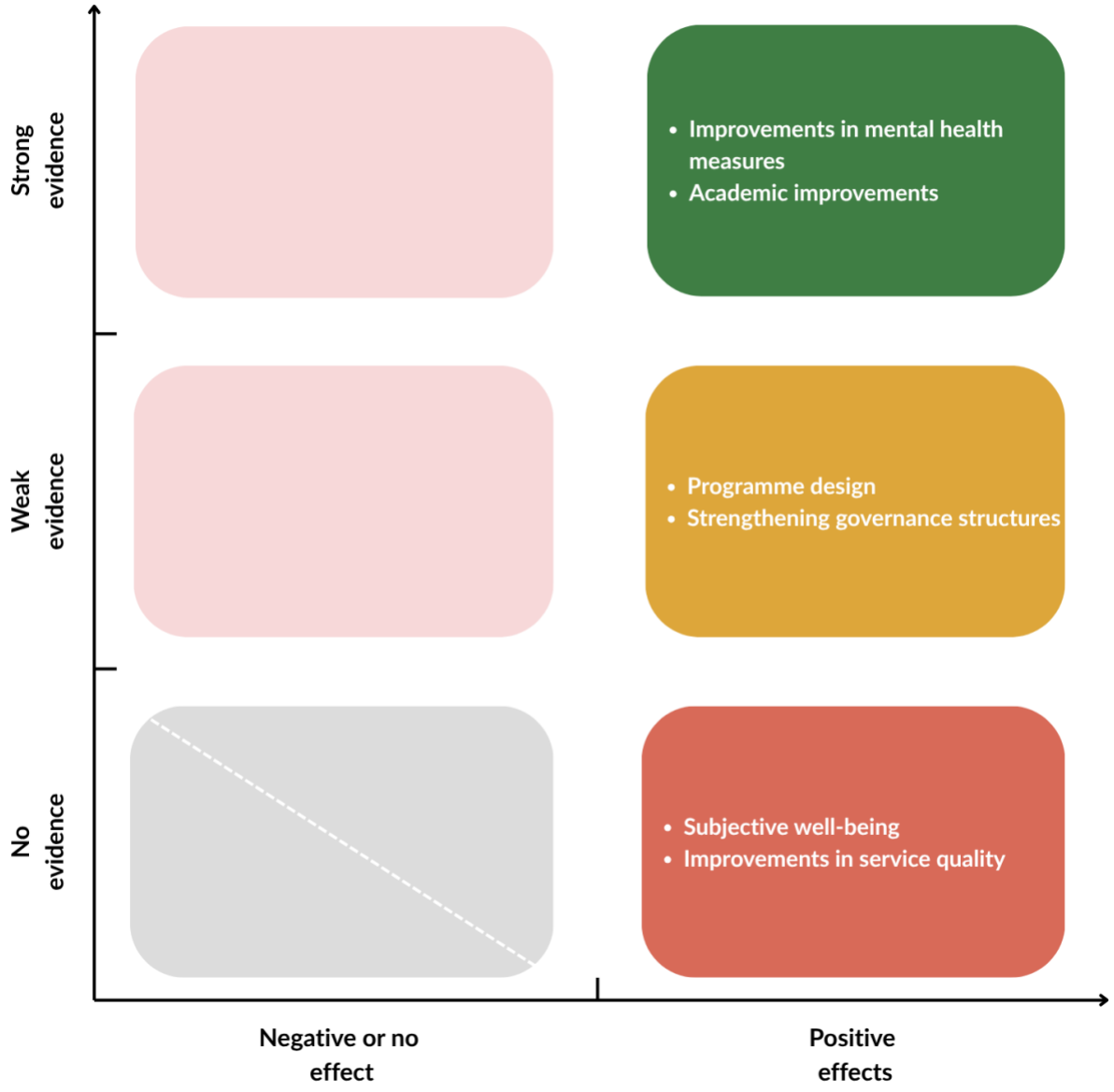

Figure 11: MHPSS, Health and Education Infrastructure+ Findings (11 sources included)

3.3.3. Equipment

A small number of studies focus on interventions that promote the use of equipment within sector systems, rather than behavioural or organisational interventions alone. One example is Sonibare et al. (2020) in Nigeria, which evaluated malaria prevention education for pregnant women designed to increase the use of long-lasting insecticidal nets (LLINs). Using a pre-test/post-test design, the study found a **positive relationship between malaria prevention education and LLIN usage**, along with **increased knowledge about malaria**

transmission and prevention after the intervention. The results highlight the **role of education campaigns in encouraging the uptake of protective health technologies.** Another example comes from a GIZ (Thayer & Hodges, 2024) programme in Liberia, which aimed to strengthen epidemic preparedness within the health system. The intervention combined laboratory upgrades, medical equipment provision, diagnostics training, and maintenance certification programmes for health staff. According to the OECD-DAC evaluation, the programme achieved its output targets and contributed to faster detection of outbreaks, improved data reporting, and stronger laboratory quality systems, thereby increasing the resilience of the health system to epidemic threats.

3.3.4. Summary of Findings and Gaps

Even relative to the studies reviewed in other thematic areas, we found very limited information (and no examples of rigorous impact evaluations) assessing infrastructure interventions in the healthcare, education and MHPSS sectors directly. While this might be understandable given the nature of such infrastructure and practical challenges associated with evaluating it in highly fragile places, it means that there is little direct causal evidence of the impact of building schools, hospitals and other health facilities on access to these services in those settings. The extent to which this presents a real knowledge gap is unclear, given the apparent strength of the underlying theory of change and the clear, broader, benefits that simply having such infrastructure is likely to bestow.

Instead, most observable impacts relate to how these facilities are used and how their use can be improved. In these areas, evidence points to improvements in direct outcomes (e.g., use of such facilities) and some outcome level impacts, particularly in the MHPSS sector. At best, however, the findings suggest that both the presence of such infrastructure and the capacity to use it is necessary to deliver meaningful impact.

As with the other thematic areas, a key gap concerns the sustainability and longer-term persistence of observed impacts. Most evaluations assess outcomes only in the relatively short-term aftermath of programme implementation. As a result, whether such effects can be sustained over time – and under what conditions – remains an important unresolved question in the literature. Multiple non-causal evaluations highlight challenges related to sustainability, particularly in ongoing conflict environments, including risks of infrastructure damage, institutional fragility, and disruptions to service delivery.

Across these studies, the strongest evidence relates to MHPSS interventions delivered through health systems or community programmes, particularly structured psychological therapies and behavioural interventions. These programmes consistently demonstrate **measurable improvements in mental health symptoms and functioning when delivered**

through existing service infrastructure. Evidence from school-based programmes is more mixed. Interventions focusing on teacher training and improvements to classroom environments appear able to influence perceptions of the school environment and, in some cases, academic outcomes. However, programmes targeting psychosocial well-being directly produce inconsistent or null effects, suggesting design and contextual factors play an important role in determining impact. Governance interventions delivered within health system infrastructure show limited evidence of direct effects on service delivery outcomes, despite improvements in organisational processes.

3.4. Institutions, Civic Engagement and Peacebuilding

This section reviews evidence on the effects of interventions on institutions, civic engagement, and peacebuilding outcomes. In the literature, we find evidence, both, of programmes that directly construct infrastructure, as well as interventions where infrastructure serves as a focal point for collective decision-making, service delivery, or governance processes.

3.4.1. Infrastructure

A small number of rigorous evaluations suggest that **community-driven infrastructure programmes can improve cooperation and collective action,** although their effects on broader social cohesion or political attitudes are less consistent. Evidence from Liberia shows that community-driven reconstruction programmes that provide funding for small-scale infrastructure, such as schools, clinics, and water points, alongside governance training, increased cooperation within communities (Fearon et al., 2015). Employing a cluster randomised controlled trial across 83 communities, this study found that the programmes strengthened collective action and participation in community decision-making, although the effects were concentrated primarily on cooperation rather than broader institutional trust or conflict outcomes. (Fearon et al., 2015).

Similarly, evidence from the Central African Republic suggests that public works programmes combining infrastructure rehabilitation with employment opportunities improve economic outcomes but produce limited effects on social cohesion. In an individual-level randomised controlled trial, Alik-Lagrange (2023) found that participation in a 40-day public works programme focused on infrastructure rehabilitation and public goods construction increased monthly earnings, asset accumulation, and self-reported well-being among participants. However, the programme produced no strong overall effects on social cohesion. Some modest improvements were observed through increased intergroup contact and stronger identification with national institutions (Alik-Lagrange, 2023).

In general, this small cluster of studies suggests that **infrastructure-related public works and community-driven reconstruction programmes can strengthen local cooperation and economic outcomes**, but their impacts on deeper forms of social cohesion or peacebuilding may be more limited.

Quasi-experimental studies provide additional evidence that **infrastructure-related programmes might strengthen trust, social capital, and institutional engagement.** For example, programmes that combine infrastructure-related activities with civic engagement initiatives appear to influence perceptions of institutions and social capital. In Yemen, a programme targeting university graduates involved participation in village cooperation councils that were responsible for activities such as rural road construction, health awareness campaigns, and support to internally displaced persons (Bertelli et al., 2019). Pre–post panel data and behavioural trust games suggest that participants experienced higher trust in institutions, greater inter-regional trust, and increased social capital, although the absence of a control group limits causal interpretation. (Bertelli et al., 2019).

However, not all infrastructure-related programmes produce measurable improvements in social cohesion. In Sudan, a programme providing community grants for public infrastructure alongside participatory governance processes found no measurable impact on prosocial behaviour or social network density, and may even have reduced network membership among participants (Avdeenko & Gilligan, 2015). These findings highlight the **mixed evidence regarding whether infrastructure-driven community development programmes translate into broader social cohesion gains.**

Overall, quasi-experimental evidence suggests that **infrastructure interventions may improve cooperation or trust in some contexts, but effects on broader social cohesion or peacebuilding outcomes remain inconsistent at best.**

Non-causal evaluations from development finance institutions provide further insights into the role of infrastructure investments and institutional capacity-building. These studies typically rely on ex-post evaluation methods rather than experimental designs and should not, therefore, be considered to identify causal impacts. Similarly, they often involve concurrent project arms operating at multiple different levels (e.g., the state, local and individual levels), which prevent accurate attribution of impacts to specific activities.

An evaluation in Niger indicates that multisector programmes combining small-scale infrastructure investments with municipal capacity building can improve aspects of local planning and participation. In particular, this occurs by increasing the integration of projects into local planning processes and enhancing participation among vulnerable

groups. However, improvements in living conditions were limited and the overall development impact of associated environmental measures was modest (KfW, 2018b).

Other evaluations highlight implementation and sustainability challenges. In Mali, the construction of a central training centre for municipal officials in Bamako - intended to strengthen administrative capacity - resulted in lower-than-expected utilisation, with only a small proportion of newly recruited staff receiving training and the infrastructure remaining underused (KfW, 2019). Similarly, a municipal infrastructure and capacity-building programme in Mauritania produced high-quality physical infrastructure outputs, including municipal buildings and urban service facilities, but failed to ensure sustainable improvements in municipal governance due to structural fiscal constraints and limited local administrative capacity (KfW, 2015).

Evidence from Ethiopia suggests more positive institutional outcomes. A programme aimed at strengthening municipal administration and urban governance capacity was observed to have increased the number of municipal development projects implemented, alongside improved residential satisfaction with municipal services. However, some programme objectives - such as environmental improvements and the reduction of national government interference in local governance - were not achieved (KfW, 2018a). More recent programming in Bangladesh focuses on improving urban planning capacity and investment planning in selected cities, reflecting an increasing emphasis on strengthening the institutional systems that govern infrastructure development rather than infrastructure construction alone (Gutierrez, 2024).

Overall, these evaluations suggest that **infrastructure investments combined with administrative capacity building can improve planning processes and project implementation**, but often struggle to achieve durable improvements in institutional performance due to structural fiscal, administrative, or political constraints.

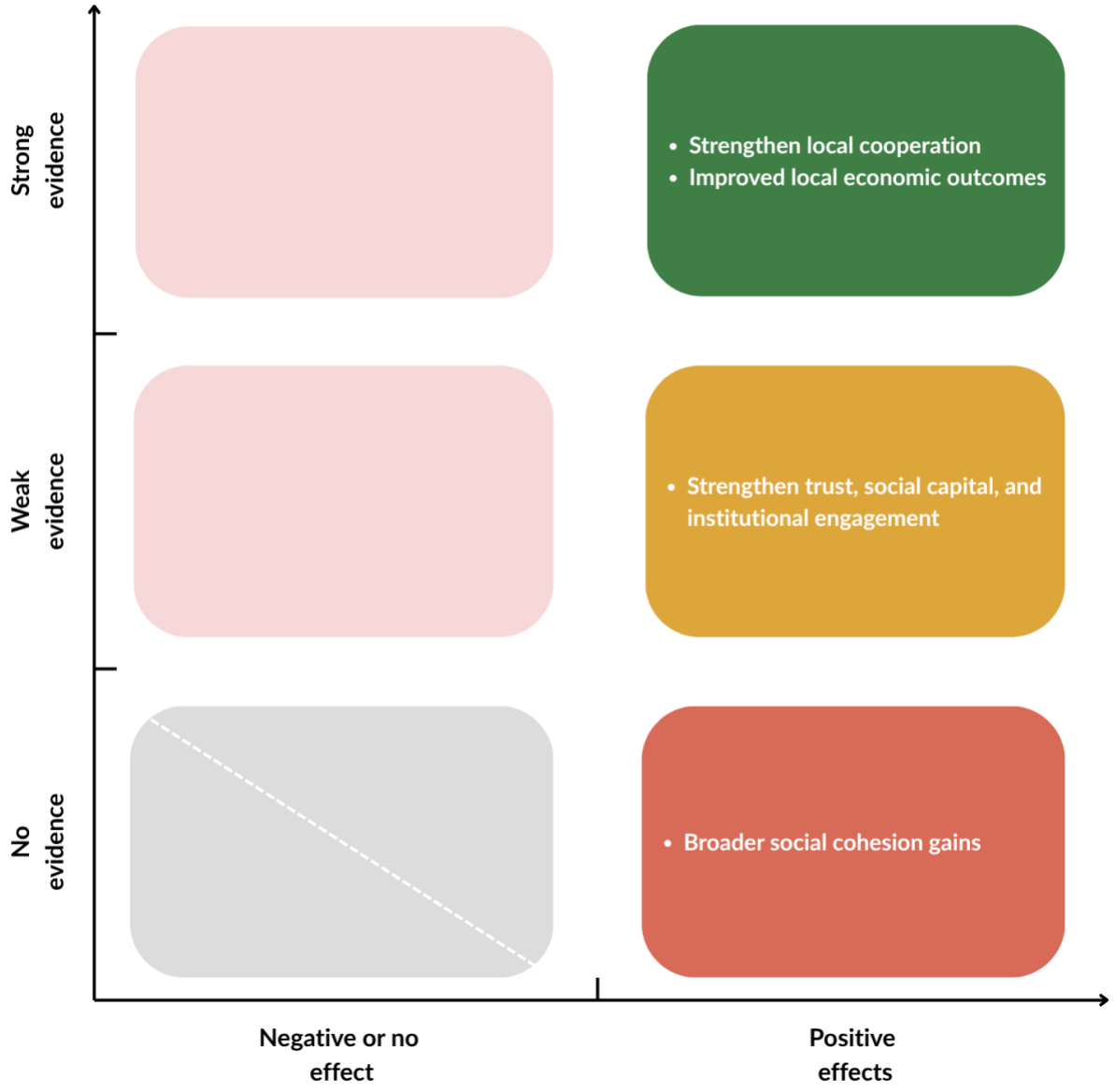

Figure 12: Institutions, Civic Engagement and Peacebuilding Infrastructure Interventions (8 sources included)

3.4.2. Infrastructure+

Another set of studies examines interventions where physical infrastructure serves as a venue or institutional focal point, rather than the direct aim of the intervention. These programmes often involve training, civic engagement, or service delivery activities conducted within existing infrastructure such as community centres, schools, or media platforms. Some experimental studies suggest that **institutional platforms built around**

community structures can improve trust and perceptions of security. In Nigeria, a programme that trained community leaders in conflict mediation and established joint peace committees and early warning mechanisms significantly improved intergroup trust and perceptions of security in treatment communities, with spillover effects on broader community relations (Dawop et al., 2018).

Similarly, programmes targeting adolescent girls that provide safe meeting spaces combined with training or empowerment activities have demonstrated meaningful social impacts. In Uganda, a programme offering vocational training, life skills education, and dedicated safe spaces for adolescent girls increased participation in income-generating activities and reduced early marriage and engagement in survival sex (Bandiera et al., 2018).

Other interventions show more mixed results. Programmes designed to create safe spaces for adolescent girls in refugee camps aim to strengthen social assets and reduce exposure to gender-based violence, but rigorous evidence on their long-term impacts remains limited (Falb et al., 2016). Similarly, programmes combining life-skills training with caregiver engagement and service-provider training have increased knowledge and uptake of gender-based violence services, but have produced mixed results in terms of safety outcomes (Tanner, 2017).

Additional evidence suggests that institutional design and accountability mechanisms may influence governance outcomes. In Afghanistan, variations in electoral rules affected the types of representatives elected to village councils responsible for deciding on public goods investments, illustrating how institutional arrangements can shape local governance outcomes (Beath et al., 2016). Similarly, mechanisms that facilitate citizen reporting of electoral fraud - such as hotline systems linked to polling centres - can reduce corruption through increased social monitoring (Gonzalez, 2019).

Finally, programmes aimed at improving economic opportunities for at-risk youth may influence conflict dynamics indirectly. Evidence from Afghanistan suggests that vocational training (and, by extension, training centres which could be a focus of infrastructure development) and cash transfers improved economic outcomes and reduced willingness to engage in activities supporting armed groups, although broader social attitudes toward conflict were largely unchanged (Kurtz, 2018).

Media interventions, again making use of new or existing broadcasting infrastructure, can also play a role in shaping social attitudes relevant to peacebuilding. In Burundi, radio dramas designed to promote reconciliation and reduce violence improved several attitudinal indicators, including tolerance, intergroup trust, and willingness to disclose

trauma, although impacts on behaviour and leadership attitudes were mixed (Bilali et al., 2015).

Across the literature, the evidence suggests that **interventions that focus on the development and use of physical infrastructure can contribute to cooperation, economic recovery, and local governance processes,** particularly when implemented through community-driven development or public works programmes**.** However, their **direct impact on deeper peacebuilding outcomes, such as social cohesion or reductions in conflict, is less studied and is often limited or inconsistent.** Infrastructure-related programmes appear **more effective when they are embedded within broader institutional or behavioural interventions,** such as community mediation systems, empowerment programmes, or governance reforms**.** Even in these cases, **impacts tend to be stronger for economic outcomes, perceptions of security, or civic participation than for deeper transformations in intergroup relations.**

Evaluations by development finance institutions further highlight the implementation challenges associated with infrastructure-driven state-building, including underutilised facilities, weak local administrative capacity, and structural fiscal constraints. As a result, infrastructure investments alone are unlikely to produce durable improvements in governance or peacebuilding outcomes without sustained institutional support.

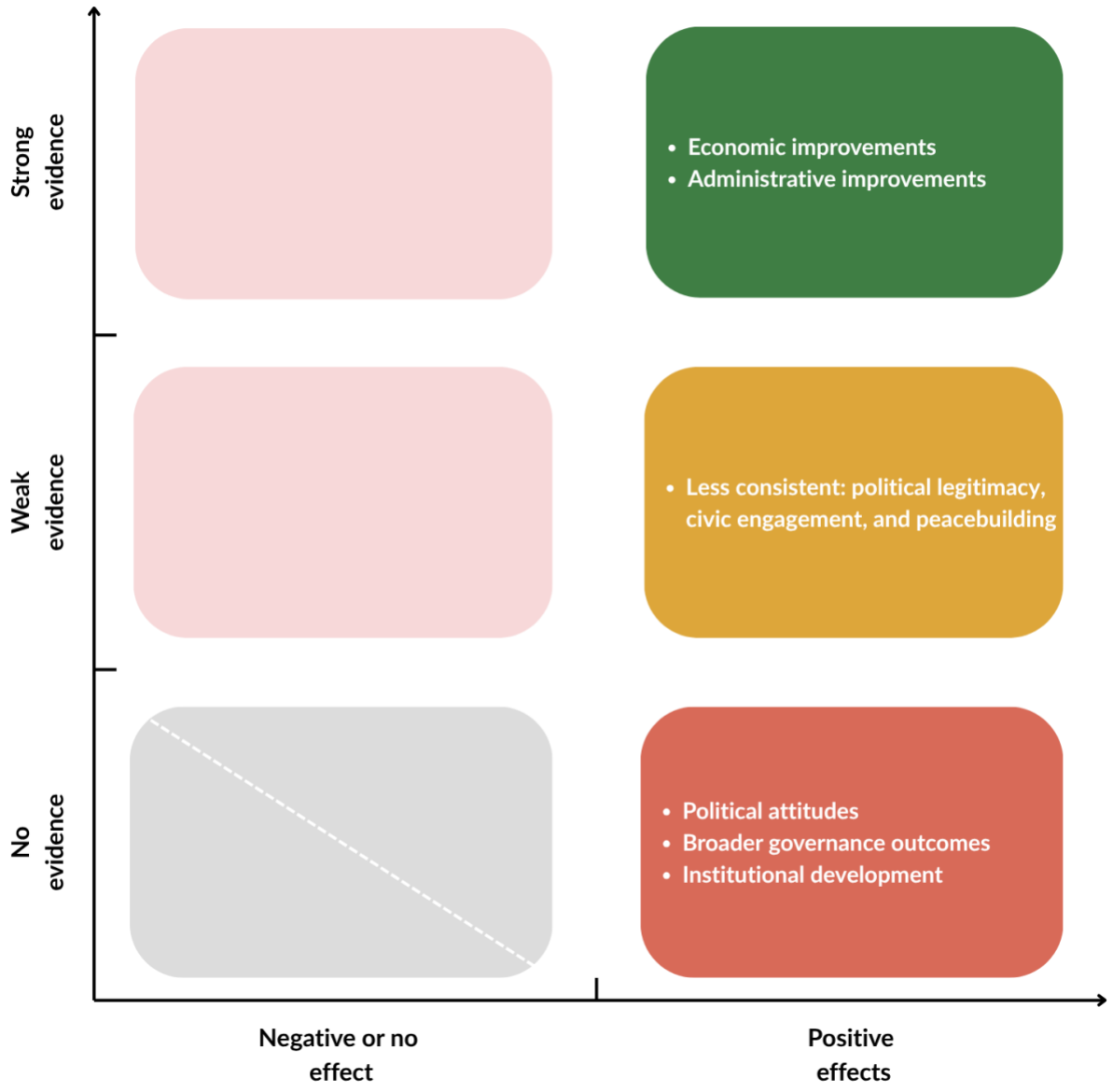

Figure 13: Institutions, Civic Engagement and Peacebuilding Infrastructure+ Interventions (7 sources included)

3.4.3. Equipment

In addition to physical infrastructure investments, some interventions provide equipment, productive assets, or digital systems intended to strengthen economic participation, improve public service delivery, or enhance government accountability. These interventions typically supply tools, digital payment systems, or information technology that enable individuals or state actors to perform economic or administrative functions more effectively.

Evidence from randomised evaluations suggests that **equipment-based interventions can produce substantial economic and administrative improvements, although their effects on political attitudes or broader governance outcomes are limited or indirect.** For example, a large randomised controlled trial in Uganda evaluated a government programme providing grants to poor and unemployed youth (Blattman et al., 2017). The grants financed productive capital such as tools and equipment, enabling recipients to establish or expand small businesses. The intervention improved economic outcomes, with earnings increasing by around 38 per cent and employment by 17 per cent among beneficiaries. However, these improvements did not translate into increased support for incumbent political leaders. Instead, beneficiaries demonstrated greater engagement in opposition political activities, suggesting that economic empowerment may increase political participation without necessarily strengthening the legitimacy of current rulers.

Other studies examine how digital equipment and payment technologies can improve state capacity and service delivery. In Afghanistan, the introduction of mobile money payments for teachers' salaries reduced opportunities for fraud and improved the reliability of salary delivery (Callen et al., 2023). Employing a cluster randomised controlled trial, the study found that the system significantly reduced salary delays and lowered the number of "ghost workers," while also increasing mobile money adoption among teachers and improving student test scores (Callen et al., 2023). These results suggest that digital payment systems can strengthen administrative accountability while simultaneously improving service delivery outcomes.

Similarly, the introduction of smartphone-based monitoring systems for government health inspectors in Pakistan improved the functioning of oversight institutions. In a cluster randomised trial, Callen et al. (2018) found that the digital inspection system substantially increased the number of hospital inspections conducted, indicating improved administrative monitoring capacity. However, the intervention did not reduce doctor absenteeism. This suggests that digital accountability tools can increase bureaucratic activity even when their downstream behavioural impacts are more limited.

Overall, these studies indicate that equipment-based interventions - particularly productive assets and digital administrative technologies - can strengthen economic opportunities and improve aspects of state administrative performance, although their effects on broader governance outcomes remain mixed.

Non-causal evaluations provide descriptive evidence on the role of digital equipment and information systems in institutional strengthening. For example, a programme in Pakistan aimed at strengthening the national energy sector supported the development and deployment of a software platform and database system to be used by government

authorities, development agencies, and private sector actors (Feibel & Ausat, 2024). The findings suggest that the system increased awareness of energy efficiency initiatives and facilitated the adoption of the new digital tools among participating institutions, although there is limited evidence on broader governance or service delivery outcomes (Feibel & Ausat, 2024).

Across this literature, **equipment-based interventions appear to contribute most strongly to economic empowerment and administrative efficiency, particularly when they provide productive assets or digital technologies that directly support economic activity or government operations.** Evidence from experimental studies suggests that such interventions can improve income generation, reduce administrative inefficiencies, and strengthen monitoring capacity within state institutions.

However, the broader implications for political legitimacy, civic engagement, and peacebuilding outcomes are less consistent. Economic empowerment may increase political participation without necessarily increasing support for incumbent governments, while improvements in administrative monitoring do not always translate into behavioural changes among frontline service providers. Programme evaluations also suggest that the success of digital governance systems depends heavily on institutional uptake and sustained use by implementing agencies.

Overall, the evidence indicates that equipment and digital infrastructure can strengthen the functioning of economic and administrative systems, but their contribution to broader peacebuilding and institutional development outcomes is likely to depend on complementary governance reforms and institutional capacity.

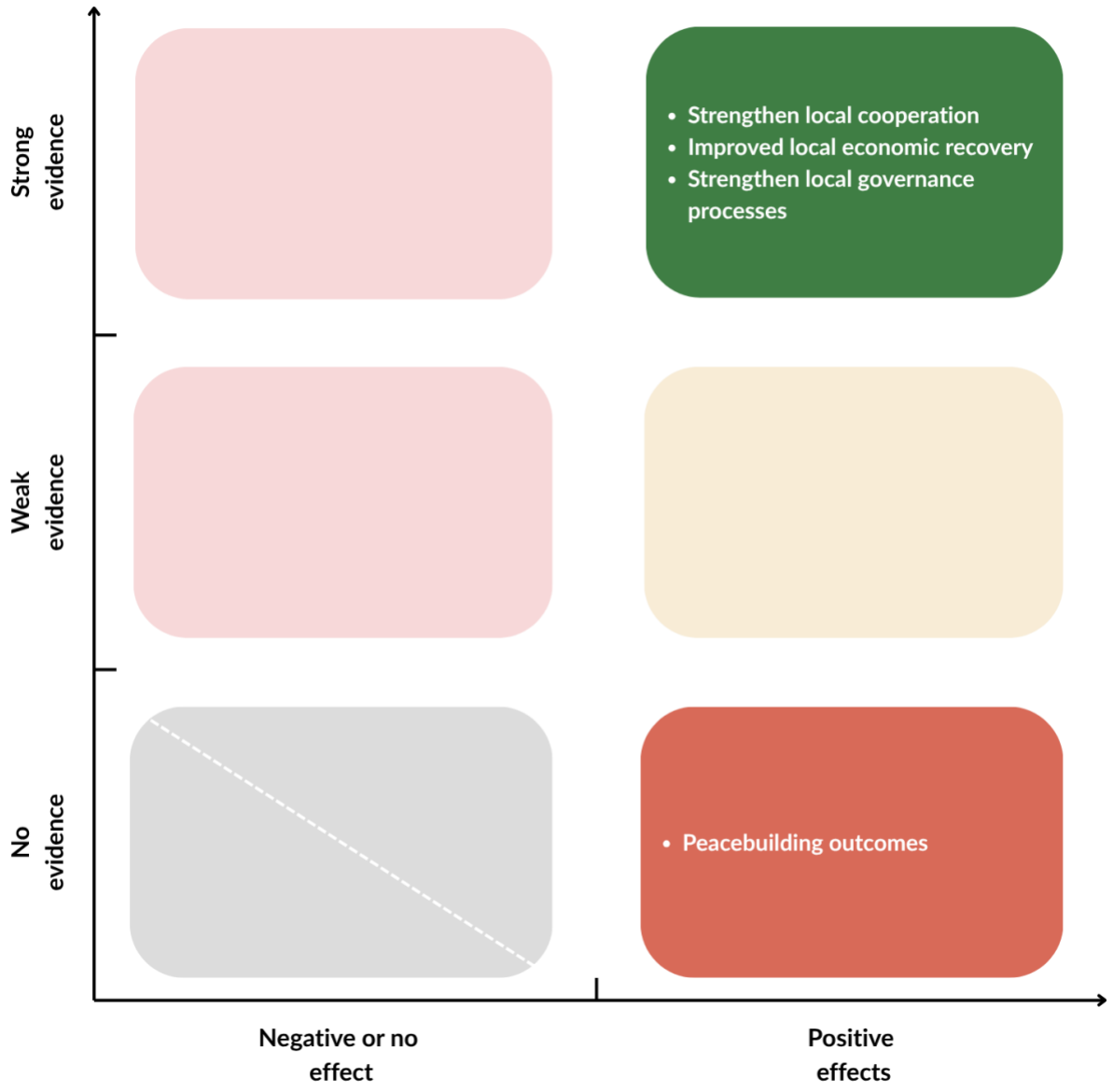

Figure 14: Institutions, Civic Engagement and Peacebuilding Equipment Interventions (4 sources included)

3.4.4. Summary of Findings and Gaps

Overall, we again find a number of high-quality evaluations covering key areas relating to infrastructure provision and associated institutional outcomes. As with WASH, however, most of these evaluations focus on short-term outcomes following the intervention and

primarily examine direct, rather than outcome level, impacts. As a result, important questions remain about the extent to which infrastructure investments – particularly when implemented in isolation – lead to broader institutional or social change in transitional settings, and about the sustainability of these outcomes over time. Addressing these questions, especially regarding the role of institution-building and associated capacity development in reinforcing peace, would help close knowledge gaps in research, policy and practice.

3.5. Multi-Area Interventions

A small but important strand of the literature evaluates multi-area reconstruction and development programmes that straddle the key thematic areas of the other sub-chapters in this document. These evaluations consider interventions holistically, rather than focussing on individual components of the intervention. Four papers emerged from our area-specific searches that assess interventions across these thematic areas: for example, combining education, health, transport, water, and economic development components within a single intervention. Evaluating programmes in this way provides a broader perspective on how different development investments interact, a question that is rarely addressed in area-focused studies.

One non-causal example is Ali (2015), which examines reconstruction and development efforts in the Swat region of Pakistan following conflict and severe flooding. Rather than examining individual projects, the study reviews how reconstruction funds were allocated and managed across a number of areas. The analysis highlights the strategic logic behind combining different forms of reconstruction, such as infrastructure rebuilding, service restoration, and economic recovery measures, in order to stabilise a region and restore normal economic and social life. By examining the overall reconstruction strategy rather than isolated interventions, the study illustrates the value of jointly considering how multiple development components function together to deliver on a broader goal - such as economic renewal - an issue that is often overlooked in evaluations that focus on single-area outcomes.

Evidence from causal impact evaluations illustrates both the opportunities and limitations of cross-area programmes. Van der Windt et al. (2018) evaluated a large-scale community-driven development programme in the Democratic Republic of Congo that provided both small grants (approximately US$3,000) to village development committees and larger grants (US$50,000–70,000) to community development committees. These funds were used to construct or rehabilitate a range of infrastructure, including schools, health facilities, and other community assets. The cluster-randomised evaluation assessed a broad set of outcomes across education, health, economic welfare, and women's

empowerment. The study finds that the programme improved the physical quality and stock of primary schools and health facilities, indicating improvements in service infrastructure and supplies. However, these improvements did not translate into broader changes in service utilisation, education outcomes, health outcomes, economic welfare, or women's empowerment. The findings suggest that while multi-area investments can improve the availability and quality of infrastructure, these improvements alone may be insufficient to produce wider social or economic changes.

Complementing this, De Juan et al. (2022) analyse the impacts of large-scale reconstruction investments across multiple thematic areas in eastern Democratic Republic of Congo. The programme included the construction and rehabilitation of schools, health centres, roads, water infrastructure, and agricultural infrastructure. The evaluation found that these investments produced measurable improvements in infrastructure quality, service provision, and local wellbeing in the short to medium term. However, the programme did not produce increases in political trust or state legitimacy among local populations. In some cases, attitudes toward the state became slightly more negative. The authors attribute this to the issue of attribution: although communities benefited from improved services, many residents did not attribute these improvements to the government, limiting any positive effects on political legitimacy. This finding highlights the importance of political context and communication in determining whether development interventions influence state–society relations.

Finally, broader insights into cross-area infrastructure interventions are provided by Schouten and Bachmann (2017), who conducted a systematic review of infrastructure projects in fragile and conflict-affected settings. The review covers a wide range of interventions—including roads, bridges, irrigation systems, water and sanitation projects, public works programmes, and community-driven development initiatives, and examines their economic, social, political, and security outcomes. The authors emphasised that infrastructure interventions are not politically neutral in conflict settings and that their effects are highly conditional. Infrastructure projects may reduce transport costs, improve service access, and create employment, but they may also produce unintended consequences, such as facilitating troop movement, attracting violence, or enabling illegal extraction and predation. The review also finds that infrastructure investments do not automatically increase government legitimacy; their political effects depend on factors such as the degree of community ownership, the institutional capacity for maintenance, and whether projects are implemented through top-down or community-driven approaches.

Taken together, these studies highlight both the promise and complexity of cross-area development interventions. Evaluating programmes in their entirety allows researchers to

capture the ways in which investments in multiple areas interact to shape broader social and economic outcomes. At the same time, the evidence suggests that improvements in infrastructure and service provision do not necessarily translate into wider changes in welfare, governance, or political trust. Instead, the impacts of such programmes appear to depend heavily on local context, institutional capacity, and the degree to which communities perceive and attribute development gains to particular actors. This underscores the value of analysing cross-area interventions holistically, while also illustrating the challenges of achieving broader transformational effects through infrastructure-led reconstruction programmes alone.

4. Cross-Cutting Remarks

4.1. Insights Across Thematic Areas

When looking across the thematic areas we have investigated, four insights common to the settings and the interventions emerge.

First, **infrastructure investments reliably produce short-term benefits**, especially for outcomes directly related to the intervention or project itself, such as **access to infrastructure and perceptions of its quality,** although causal evidence is not universally available. While this might seem self-evident, a range of barriers – such as concerns about physical safety – might limit access even when infrastructure is geographically nearby in highly fragile places. There also appears to be **clear benefits to combining infrastructure investments with complementary inputs**, such as equipment provision and/or training. However, while several studies across these areas examine such integrated approaches, they represent only a minority of the overall evidence base, and accordingly, knowledge gaps in key thematic areas still remain.

Second, there is a **clear distinction**, both within and across the thematic areas (MHPSS, Livelihoods, etc.), **between analyses that focus on direct infrastructure-related outcomes and those that assess broader-level impacts.** In some thematic areas, such as WASH infrastructure, studies tend to focus primarily on direct outcomes rather than outcome level effects. In others, such as health and education, the emphasis often falls on outcome-level indicators, perhaps because direct outcomes such as access can be inferred from downstream measures such as enrolment, service utilisation or outcomes (e.g., disease prevalence). Relatedly, in several settings **the provision of infrastructure alone does not appear sufficient to generate broader outcome-level improvements**. This suggests that combining supply-side interventions (such as infrastructure provision) with demand-side measures (such as training or behavioural programmes) might generate important synergies.

Third, there is **very little evidence on the long-term impacts of Infrastructure, Infrastructure+ or Equipment interventions, nor the sustainability of these interventions**. Most studies focus on the relatively short-term aftermath of the intervention and measure impacts within relatively narrow timelines. Where longer-term outcomes and sustainability are discussed, they are typically raised as caveats to the interpretations of the findings rather than empirically examined. This contrasts with the range of short-term benefits observed across thematic areas. In the short-term, the evidence points to improvements in planning processes and project implementation in target countries, although the ability to attribute these directly to the infrastructure and not project management might be up for discussion. We have found evidence for short-term increases in income and employment stability, improved access to services provided directly by such infrastructure projects, as well as the improved functioning of area-specific systems. There have been improvements in local measures of economic outcomes or cooperation, without much evidence for a spillover or multiplier effects that might be hoped for from large investments.

Fourth, **community involvement in decision-making and planning of these projects appears to play an important role in delivering positive outcomes and might provide valuable insights for future project design**. Projects that involved community structures typically led to short-term improvements in trust and perceptions of security. More generally, the evidence suggests that combining interventions has benefits. For instance, delivering training alongside resources and institutional support can lead to sustained economic benefits that training or infrastructure on its own might not have delivered. This was also observed in analyses that examined multi-area investments as a whole. These analyses were beneficial as it can often be difficult to attribute the cause of a benefit of one intervention in a multi-area or multi-intervention project, and these sorts of analyses provide holistic views of the project and can help to better understand the role that each investment provides.

There is some evidence showing that these projects are successful in raising awareness about the programs and the targets of those programs, for example violence reduction. However, there is very little evidence of associated attitudinal or behavioural change as a result of exposure to these interventions. There is little evidence of long-term improvements in income or employment stability, even as a result of economic / livelihoods interventions. Projects may even improve perceptions of security and stability without generating improvements in actual economic activity or long-term economic outcomes. There is still much to be learned about the connection between physical infrastructure and equipment provision projects and the development of longer-term outcomes connected with reconstruction - trust, cooperation, governance, and attitudes

towards institutions tasked with providing security, encouraging trust and cooperation, and delivering accountable governance.

4.2. Discussion

Especially given that this review seeks to look across multiple thematic areas relevant for TDA and reconstruction interventions, the overall scale of both causal and non-causal evidence uncovered is somewhat limited. Accordingly, while there is key evidence in the fields developed in highly fragile settings, the overall universe of documentation is small in relative and absolute senses. For example, while our initial keyword searches uncovered over 40,000 research items focussing on WASH, fewer than 100 of these "hits" matched our scoping, relevance and quality criteria. Of those that did, only a minority pertained to infrastructure provision, with others focussing on other aspects of WASH provision.

While the scoping and relevance criteria were quite restrictive, with narrow focusses on the typologies of intervention, the time period of interest, the geography of interest, and the specific technologies of intervention, the broad lack of evidence is a key finding of this review. Ultimately, and as is well established, there is a general dearth, although not a complete absence of, evidence produced in the kinds of highly fragile places that necessitate reconstruction interventions. This means that even the key, positive, findings in this document are based on a small number of positive examples, rather than deep, structural, sources of information.

There are a number of possible reasons for these gaps in the scale of evidence, however, that go beyond the relevance criteria applied to this study. On the practical level, collecting and analysing high-quality data in highly fragile settings is notoriously difficult. Accordingly, while a focus on these highly fragile settings is necessary for the focus of this work on reconstruction, this focus likely "omits" relevant foundational research on infrastructure, derived from more stable development settings. However, there are a number of reasons to believe that the theories of change that might govern outcomes in more stable settings might not apply in fragile settings. Accordingly, there is a need for specific knowledge development in such settings, even when that is often practically difficult, and some caution in attempting to apply more general lessons from non-fragile settings. The weak institutions that characterise fragile and post-conflict settings, for example, could result in conflicts over management of and access to infrastructure. Infrastructure could become the target of attack or, indeed, a target for control. Its provision might not directly overcome other constraints, such as perceptions of danger in going to such places or norms around their use. This calls for work that focuses on infrastructure more generally in fragile settings, and particularly, in reconstruction settings.

Second are conceptual issues related to the use of causal statistical techniques to understand the impact of infrastructure projects. These studies require a sufficiently large number of "units" (e.g., boreholes dug, education facilities built) for accurate statistical inference to be drawn. While, for some forms of infrastructure, it is plausible that a sufficiently large number of units will be provided for a feasible study (e.g., wells or latrines), this is less clear when it comes to other kinds of infrastructure, such as schools or hospitals, let alone massive infrastructure projects such as ports or special economic zones. Relatedly, there could be issues defining the "catchment" area of such infrastructure within studies that tend to focus on treatment and control groups. For example, does a village benefit from a well dug in the next village over? Conceptually, these factors could complicate studies of infrastructure projects.

Related to this, theories of change, at least at the direct outcome level, might appear *a priori* obvious and, thus, complicated efforts to measure this causally in complicated, highly fragile settings might not be a priority. For example, the theory of change that would link the building of a new hospital to individuals' perceptions of access to healthcare seems obvious, even in these settings. Studying training-only interventions might overcome some of these conceptual issues, yet this risks making assumptions about the quality and availability of infrastructure. Training to better use WASH or community facilities, for example, is only sensible when such facilities are present. Particularly in highly fragile settings and the aftermath of violent conflict, that might not always be true.

The issues with identifying sources of non-causal literature is more likely reflective of how M&E information is collected, managed, used and published by implementing organisations. We find very few examples of project-level evaluations, such as endline reports, in the public domain. Few published examples of such documentation could be accessed. While we accept that contributing to wider knowledge is not, necessarily, the purpose of such documentation, it could still be useful, particularly in the absence of higher-level causal evidence.

A number of other caveats might also be important and relevant for understanding and interpreting the evidence base presented in this review.

First is that, in seeking to look across thematic areas, some clear overlaps emerge. Some studies could, in principle, be differently placed than they are in this document. For example, Blattman et al. (2017) could be considered as much a livelihoods intervention as one about MHPSS. Other interventions provide cash for work in the process of building infrastructure, which could be considered amongst livelihoods interventions, or classified by the type of infrastructure built. In an effort to avoid "double counting", we have sought

to assign these interventions to particular themes. Inherently, there is likely some subjectivity within these decisions.

Second, more generally, there is some subjectivity in the inclusion or exclusion of certain interventions that rely on infrastructure. Indeed, almost all interventions, in some way, could be defined to rely on infrastructure. For example, while we do not consider food aid in this review, it might rely on roads on which to transport nutrition supplements, health centres from which to distribute it, and so on. In some cases, such as employment training, it was not immediately clear where lines should be drawn. Where ambiguities arose, a decision was made to include rather than exclude interventions on the margin. This risks over-emphasising the impacts of some interventions (e.g., livelihoods training) and de-emphasising others from the perspective of TDA, reconstruction and infrastructure more broadly.

Finally, to some degree, there is similar subjectivity even in the thematic areas that are included in this review and how they are aggregated and considered. These are derived from past reconstruction and TDA interventions. Different readings of the bodies of past work might include or exclude some of these areas, or might aggregate them differently. Again, the discussion and presentation of findings should be understood in this context.

5. Conclusion - A Matrix of Learning

At the core of this study are questions that pertain to the extent, nature and quality of the evidence that assesses the impact of reconstruction interventions in highly fragile settings. For the purposes of this work, we consider reconstruction to be interventions that provide infrastructure, that directly relate to the creation of infrastructure (e.g., training on its use or interventions to manage its use), or provide equipment essential for the infrastructure to perform. Based on past interventions funded under TDA, we focussed the review on five thematic areas: WASH; institutions, civic engagement and peacebuilding; livelihoods; MHPSS; health; and education.

We note that a specific kind of infrastructure might be used as a means to target outcomes under more than one area and, accordingly, focus on the outcomes targeted in the evaluations that comprise the data for this work. The reviews were interested in outcomes at two main levels. The first are direct outcomes, which pertain to the presence of, access to, quality of, and satisfaction with the infrastructure. The second relates to the outcome level - that is, the outcomes that the intervention is designed to change. These vary from one thematic area to another but, in the case of WASH for example, would relate to indicators such as incidence of disease; in the case of peacebuilding, to social cohesion; and in the case of education to attainment and enrolment. Additional downstream effects (e.g., on social cohesion more broadly) were considered within the review but were not

viewed as a main motivation of the work. Finally, we considered the extent to which reported findings were observed in the short or the long-term.

Within each thematic area, we find a range of supporting evidence from both causal and non-causal literature, although for the most part, this only relates to impacts observed in the short-term. More specifically:

In the case of WASH, we find consistent evidence that the provision of infrastructure has positive impacts at the direct level. However, particularly when provision of infrastructure is not accompanied by education campaigns, we note a key knowledge gap emerges about the links of infrastructure to outcome level impacts. For the most part, these impacts are not measured, and when they are, impacts tend not to emerge. A small, but far from conclusive, body of evidence suggests that these impacts might be more likely to emerge when infrastructure takes place along with additional project components, such as knowledge provision and training. This suggests that infrastructure, by itself, might be unable to change the main outcome level goals of WASH infrastructure provision. By contrast, some strong evidence emerges that supports the impact of WASH equipment, broadly defined, on key outcome level impacts. For the most part, this pertains to equipment needed to maximize the impact of WASH (e.g., soap), rather than, for example, equipment for the maintenance of the WASH infrastructure.

In the case of Institutions we uncover little evidence of rigorous work that links the development of infrastructure to its availability, access or quality. However, we note that most of the interventions reviewed under this area are types of intervention that are covered elsewhere (e.g., water points) and, accordingly, we can already infer something about their direct outcomes, at least in some thematic areas. Most of the reviewed studies consider how infrastructure is developed and managed. Community driven infrastructure seems to improve cooperation, collective action and trust as well as, in some cases, economic outcomes. This suggests that there is evidence to link these kinds of inputs to some outcome level effects. However, higher-level impacts, such as social cohesion, tend not to be the focus of this work and do not emerge when it is considered. Similarly, training, particularly of those involved in local institutions, to use existing infrastructure and use them to deliver services are shown to have some outcome level outcomes, particularly on trust and perceptions of security. When considered as a form of "equipment", digital systems tend to have positive effects, particularly on economic outcomes, although their impacts on governance and political outcomes is more limited.

A key gap that emerges in this thematic area is that there is an absence of work that considers the role of infrastructure on outcomes relevant to the theme. For example, the building of community centres, conflict dispute tables and related infrastructure. While

such infrastructure has been evaluated in more general development settings (e.g., under community driven development approaches - see: Wong, 2012)[13], we find no rigorous studies that evaluate such infrastructure within the scoping confines of this work.

In the case of Livelihoods, we find very few examples of rigorous evaluation work that seeks to understand either the direct or outcome level impacts of providing infrastructure pertaining to livelihoods. This could include, for example, vocational training centres, job exchanges, etc, as well as large-scale developments, such as ports and roads. Consequently, a small gap emerges where it is unclear if, simply, building such infrastructure is sufficient to improve access to such facilities and to understand if access, alone, has meaningful impacts on individuals' livelihoods. We find similar gaps when it comes to considering *training* in the narrowest of senses - that is, for example, training to improve instruction on the supply-side and training to raise awareness on the demand side. We do not, for example, find any direct evidence that addresses whether or not awareness campaigns or improved instruction result in increased uptake of services in highly fragile settings.

Accordingly, most of the evidence that links infrastructure and training to livelihoods emerges in two main areas. The first is in "cash-for-work", where people are employed during the creation and building of infrastructure. In general, results here appear positive but, by definition, only in the short-term. Once the infrastructure is built, most of the cash-for-work jobs disappear. The second is in more general training (e.g., skills training for work or entrepreneurship). A key question emerges about how directly relevant these trainings are to reconstruction as defined in this work and, overall, findings in this area tend to be mixed. Training seems to work best when paired with other inputs (e.g., cash or internships), or alongside the provision of "capital", such as livestock.

Such findings are perhaps not surprising. For example, Blattman and Ralston (2015)[14] already offer hints that most jobs-based interventions in fragile places are focused on the individual. There is an implicit role of infrastructure, even at this level (e.g., it is difficult to train people without a venue in which to train them). This infrastructure has, perhaps, not been the focus of past bodies of work but at the same time, its role can be inferred both by its use and our understanding of the outcomes of its use. An alternative explanation is that this formative work took place outside of the temporal scope of this study.

[13] Wong, S. (2012). What have been the impacts of World Bank Community-Driven Development Programs? CDD impact evaluation review and operational and research implications. *World Bank, Washington, DC, 7*.

[14] Blattman, C., & Ralston, L. (2015). Generating employment in poor and fragile states: Evidence from labor market and entrepreneurship programs. *Available at SSRN 2622220*.

As with economic and livelihoods interventions, we find surprisingly few examples that link the creation, rebuilding or repair of physical health or education infrastructure to direct outcomes. While this is also true for MHPSS infrastructure, our review of the evidence suggests MHPSS support mostly relies on existing infrastructure, including health centres. The knowledge gaps that emerge, therefore, could again be due to the scoping constraints of our review or that such outcomes might be inferred from outcome level impacts (e.g., on health outcomes). However, even on these outcome levels, we find surprisingly scant rigorous evidence on the impacts of infrastructure. Stronger evidence emerges around the use of infrastructure for additional purposes. Using existing healthcare centres to deliver MHPSS interventions, for example, has been shown to have positive impacts in multiple settings but this relates to the MHPSS provision more than the infrastructure itself. Similarly, interventions delivered through school systems have been shown to have a range of positive outcome level impacts, including on academic and psycho-social outcomes (and when paired with WASH inputs and knowledge, also health outcomes). Accordingly, we learn that provision of such infrastructure has important connotations for the subsequent delivery of other interventions, which are known to improve related outcomes. However, in general, this suggests the potential need to pair infrastructure with other programmatic inputs to deliver, or at least to maximise, impacts.

At the more general level, this review was conducted with the understanding that, especially until relatively recently, highly fragile places have tended not to be the focus of rigorous impact evaluations. Accordingly, our aim has been to prioritise the relevance of the information that does exist, rather than to repeat long-standing concerns around the lack of rigorous evaluations in such settings (see, for example, Fajardo-Steinhäuser, 2026).[15] However, the results and synopsis presented here should still be understood in the context of these wider limitations. Even in the cases where knowledge is deepest, key takeaways often rely on the observations of a small number of studies, rather than on broader systematic reviews or meta-analyses that combine the findings of multiple studies. At the general level, therefore, key knowledge gaps still remain about highly-fragile settings, in general, and about infrastructure building, management and rehabilitation in these settings specifically. Our work also highlights that there is a particular need to consider these effects in the long-term and to focus on factors such as sustainability. The absence of such studies is the most consistent knowledge gap across the themes we consider in this work.

However, we also note that careful consideration must be given to how we think about the impact of infrastructure-based interventions and how it can and should be measured.

[15] Fajardo-Steinhäuser, M. (2026). Beyond the Comfort Zone: Bringing Empirical Research to Fragile Countries." IGC Working Paper XXX-25226

Infrastructure, for the most part, covers relatively wide geographic areas. In many forms, it is non-excludable (and when it is technically excludable, the nature of the intervention is such that in a practical sense, exclusion remains undesirable). As such, it tends to be available to most, if not all, people living within nearby catchment areas. This poses practical problems for the kinds of rigorous studies that we note are typically absent. The technicalities of these methods might, for example, require significantly more "units" of infrastructure (e.g., the number of new schools or health centres) than is often practical, generally, and in highly fragile settings in particular. This is particularly true for very large pieces of infrastructure, such as ports or special economic areas. Accordingly, when it comes to closing the knowledge gaps we highlight, there is not only a need for action but a need for careful thought about how this action should look and for a broader range of tools to be deployed to close these gaps.

A final gap that this work uncovers relates to reconstruction itself, and its ultimate aim, which is to protect against future risks. This might mean that infrastructure programs, generally, should contribute to wider increases in economic and social stability, as well as to their direct and outcome level aims. Such "cross-partials" (for example, that infrastructure contributes to economic wellbeing, which in turn contributes to social cohesion) are well-theorised, yet we find little evidence that such questions have been asked in the literature, particularly infrastructure-based interventions. Ultimately, if a key role of TDA is crisis prevention, such factors are of fundamental importance in this field and constitute a key knowledge gap that should, with urgency, be addressed.

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