IDinsight

WBR Cost-Effectiveness Analysis

Original: July 23, 2025
Updated: October 22, 2025

Report authors:
Jeff McManus: jeffery.mcmanus@idinsight.org
Kashif Ahmed: kashif.ahmed@idinsight.org

WBR CEA model_2025

Summary

This report presents a cost-effectiveness analysis of World Bicycle Relief's (WBR) programs across three domains - livelihoods, education, and health - using rigorous impact data from two RCTs, results from WBR's internal monitoring, insights from key stakeholder interviews, and transparent modeling assumptions. The analysis finds that WBR's Mobilized Communities (MC) program in Zambia yields a strong return on investment (ROI), delivering approximately 14.7 times the value of its costs through increased household consumption, asset accumulation, and modest positive spillovers. Compared to peer livelihoods programs in sub-Saharan Africa, the MC program ranks among the most cost-effective. Monitoring data on WBR's social enterprise model and MC programs in other countries may achieve similarly strong or even greater returns, extending the relevance of these findings beyond the Zambian context.

In the education sector, the Bicycle Education and Empowerment Program (BEEP) increases school attendance by an estimated 33 days per girl over five years, and shows potential for longer-term socioeconomic benefits. While these returns are somewhat lower than those of the MC program, they are comparable to cost-effective education interventions in low- and middle-income countries (LMICs), such as scholarships and cash transfers. For health programming, the analysis finds that community-based volunteers (CBVs) with bicycles are projected to reach 2,811 additional clients over five years. Initial analysis of health outcomes from administrative data reported by health facilities was inconclusive, and so further data is needed to link these productivity gains to improved health outcomes.

This report was initially prepared using data from the Year 1 endline of the MC RCT conducted in June 2024, then was updated when data from the Year 2 endline conducted in June 2025 became available. Specifically, we observed that two years after receiving bicycles, and one year after the end of widespread drought in Zambia, treatment households experienced even larger increases in household consumption and assets than the control group. We interpret these results as evidence that the impacts of bicycles on livelihoods are slightly greater during a non-drought year than during a drought year, and that impacts are likely to be sustained for several years after bicycle receipt.

1. Approach to cost-effectiveness analysis

Our goal with this cost-effectiveness analysis was to estimate the return on investment (ROI) of different WBR programs targeting different aims (livelihoods, education, health). We do not expect CE estimates to be exactly the same in every WBR program, but we expect that by basing our estimates in rigorous impact measurement, and by making transparent our model parameters and assumptions, that this exercise will provide indicative evidence of the cost-effectiveness of other WBR programs.

We followed several principles to conduct this CEA:

- **Alignment with sector leaders**: Our approach to CEA was informed by how sector leaders conduct and report CE, including J-PAL (link), the International Rescue Committee (link), Livelihood Impact Fund (link), One Acre Fund (link), and Mulago (link). During stakeholder interviews, we pressure-tested our methods with WBR staff and board members, including leaders from several prominent international development foundations.
- **Transparent calculations**: Our CE estimates depend on numerous inputs and assumptions. We share our full CE model (WBR CEA model_2025) to allow the reader to explore the sensitivity of CE estimates to alternative inputs. We disaggregated cost calculations to show the main cost drivers and distinguish between up front costs and recurring costs. We also highlighted adjustments that we made to both impacts and costs to account for local inflation and present value discounting.
- **Selection of appropriate metrics**: In selecting metrics, we balanced between what metrics are meaningful and what we can confidently report based on existing data. For livelihoods we compared economic benefits to costs. For education we reported additional schooling attributable to bicycle ownership; we extended this to estimate lifetime returns to income. For health we reported additional households reached by health workers who own bicycles.
- **Impacts measured from causal data**: Impact estimates were derived from two RCTs: the MC RCT (livelihoods, health) and the BEEP RCT (education). We believe that these impact estimates are highly reliable. In our desk review, we observed that CE estimates of other programs that did not draw on rigorous impact data were often unrealistic. At the same time, we recognize that the MC and BEEP programs may not reflect exact WBR programming in other contexts (particularly future government partnerships). We therefore consider impact estimates as proof-of-concept for the impact that can be achieved by WBR, and costs as upper bounds on per-bicycle costs in partnership models.
- **Dynamic estimates**: We consider these CE estimates to be our best guess based on existing data. Further updates to these estimates (particularly the sustainability of impacts, and impacts on health outcomes) may be appropriate if new data becomes available in the future.

2. Livelihoods programming cost-effectiveness

We estimate that giving bicycles to livelihoods group members through the Mobilized Communities program in Zambia has a 14.7x return on investment over five years. In other

words, the benefits to bicycle recipients are 14.7x the cost investment of the bicycles and administering the program**.** The cost-effectiveness of the MC program is indicative of the cost-effectiveness that can be achieved by other WBR livelihoods programs in other settings.

Benefits calculation

To estimate the impact of the bicycle on livelihoods, we draw on results from the first and second year endlines of the MC RCT (link). The initial estimates based on the Year 1 endline have been updated to account for Year 2 endline results.

We estimate that livelihoods group members (LGMs) who received a bicycle will experience, on average, $3,188.16 in total economic benefits over five years. ***Figure 1*** is a screenshot from our CE model that shows how we calculated benefits.

Figure 1: Benefits calculation, Livelihoods CEA

Benefits	***Parameter choice***	***Inputs***
Treatment effect (monthly): Consumption or Income?	Consumption-Upd…	$46.85
Spillover effect	Include	$5.25
Number of years effects are sustained	5	5.00
Asset treatment effect: Include or Exclude?	Include-Updated	$581.28
Discount rate	Include - 10%	10.00%
Total benefits		***$3,188.16***

Our preferred impact metric combines household consumption with net wealth and spillover benefits to neighboring households. We prioritize household consumption over household income for several reasons. First, consumption more comprehensively reflects a rural household's economic situation than income, since consumption includes household own production (such as growing crops for subsistence) and remittances. Second, consumption is less vulnerable to seasonal variation than income, as households strive to smooth consumption over time through borrowing and saving, and thus better reflects the household's steady-state economic condition. In contrast, income can be highly variable for rural households depending on when data is collected vis-a-vis harvests. Third, since consumption is measured in a highly disaggregated method (with respondents reporting on amounts consumed for a basket of 50+ goods) and then aggregated up during analysis, we believe that it is less prone to response bias than income, which respondents report in a single survey item.

Nevertheless, since many livelihoods interventions commonly anchor to income effects, we included the MC income effect as an optional input in our model. Since the effect of the MC program on reported income is smaller than the effect on household consumption, our CE estimate falls from 14.7x to 10.2x when using income.

We include net changes in wealth in our benefits calculation to reflect that households are not only consuming more (or generating more income) but also experiencing positive changes in their

wealth holdings - including durable assets, agricultural assets, savings, and reduced debt. The treatment effect on net assets is greater than the value of the Buffalo bicycle, indicating that households are able to leverage the bicycle to increase their savings and assets.

We also included a minor adjustment to account for positive spillovers from treatment households sharing the bicycle with other households. During endline data collection we asked treatment respondents if they had shared the bicycle with individuals outside of their household, and we asked control respondents if they had borrowed a Buffalo bicycle. On average, treatment recipients reported sharing the bicycle with 5 people outside the household over the previous year, and average Buffalo Bicycle usage in the control group was 5 days per year, leading to our estimate of 25 days of usage for non-recipient households. Since treatment households reported using the bicycle on average for 223 days in the previous year, we therefore assume that the total spillover benefit per bicycle is (25 days of non-recipient usage)*(effect of bicycle in treatment group)/(223 days of typical usage in the treatment group). Our estimate of spillover effects accounts for about 10% of the total effect of the bicycle.

A key assumption in our CE model is that benefits are sustained for five years. We believe that this assumption is justified since the Buffalo bicycle is designed for durability, has a 5-year warranty, and bicycle recipients in the MC program signed contracts to bring the bicycles for monthly maintenance for five years. Internal discussions with the WBR product team suggested the bicycles may have a durability of up to 15 years, and so we consider five years to be a conservative lower bound for most bicycle recipients. However, bicycle durability is only one factor affecting impact over time. Changes in bicycle usage and external conditions may also affect ongoing impact; in Zambia in particular the impact of the drought in 2024 appears to have slightly decreased impact that year. Data from the second endline of the MC RCT demonstrates that impacts did not decline over time, and in fact slightly grew, strengthening our confidence in the sustainability of impacts over time.

Finally, we applied a 10% annual discount rate to benefits accrued after the first year (we applied a similar discount rate for costs incurred after the first year). Discounting future benefits reflects the fact that benefits in the near-term are inherently more valuable than benefits in the far future. Since it was impractical to estimate precise discount rates for all current and future bicycle users, we elected to use a 10% discount rate, as this is the most commonly-applied discount rate by researchers and policymakers when calculating cost-effectiveness of programs in LMICs. (See Dhaliwal et al 2012 (link), especially pp. 38-40, for a comprehensive description of present value discounting, and for a review of discount rates used by other researchers, converging around 10%).

Costs calculation

We estimated that it costs $216.81 over five years to give a bicycle to an LGM and deliver the MC program. ***Figure 2*** is a screenshot from our CE model that shows aggregated costs; line-item costs are available in the “Livelihoods-costs” tab of the spreadsheet.

Figure 2: Costs calculation, Livelihoods CEA

Costs	
One-time costs per bicycle recipient	$131.90
Annual recurring costs per bicycle recipient	$18.84
Number of years recurring costs are sustained	5.00
Reduced Year 1 repair costs	-$10.92
Inflation rate	10.94%
Discount rate	10.00%
Total costs	***$216.81***

We distinguished between one-time costs ($132) and recurring costs ($85 over five years). One-time costs include the bicycle itself (parts, labor, warehouse storage), bicycle distribution, set-up costs for Bicycle Supervisory Committees and training costs for mechanics, and post-distribution monitoring and coordination meetings. Recurring costs include annual salaries for field coordinators, program officers, and monitoring officers, for five years (the duration of the MC program and our projection of benefits). To reflect the total cost of bicycle ownership (and not only the costs incurred by WBR), we included repair costs incurred by bicycle recipients, which we derived from WBR's internal monitoring data in Zambia. Notably, this data showed that repair costs increase substantially after the first year, and so our model makes a similar assumption. We did not include costs in our model related to registering and setting-up WBR in-country; our model reflects the marginal costs of running an MC program in a country where WBR is already present.

We assumed that costs will increase at a similar rate as local inflation, which we project from 2022 and 2023 World Bank data for Zambia.[1] We also discounted future costs using a similar 10% annual discount rate as we used for discounting future benefits.

Comparability with peer programs

The cost-effectiveness of WBR's MC program compares favorably with other livelihoods programs in LMICs. In fact, we only identified one other livelihoods-focused program that had been rigorously evaluated with a better ROI: VisionSpring's THRIVE eyeglasses program in Bangladesh (43x ROI), which had a smaller impact on income than WBR's bicycles, but at much lower cost per recipient.[2]

[1] World Bank historical inflation data based on the consumer price index in Zambia can be found here: https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=ZM

[2] Other livelihoods programs claimed higher cost-effectiveness, such as Spark Microgrants for village-level investments in pig farming in Rwanda (28x), and AkiraChix bootcamp for training young women in coding skills in Kenya (10.5x) (link). However, programs like these with high cost-effectiveness estimates relied on impact models rather than estimates from rigorous impact evaluations (with the exception of VisionSpring). We were hesitant to ascribe much credibility to these models until they are backed by evidence.

Aside from VisionSpring, most peer programs that report cost-effectiveness are in the range of 3x-6x ROI. Even this range is likely on the upper-end of the cost-effectiveness of livelihoods programs due to selection effects: only programs that are likely to be cost-effective will have commissioned rigorous causal studies and report on their own cost-effectiveness. Moreover, most CE calculations do not report or justify key assumptions, such as the sustainability of impact estimates, whether future benefits and costs were discounted, and whether costs incurred by other stakeholders (such as users) besides the implementing organization were included. Hence these CE estimates should be considered indicative rather than precise.

Table 1 reports on CE estimates from comparable livelihoods-focused programs.

Table 1: CE estimates from peer livelihoods programs

Program	CE estimate	Notes
Income-generating interventions		
Bridges to Prosperity: Trail bridges in Rwanda	3.5x	ROI calculated from income impact on communities connected by trail bridges in Rwanda (+$33k per year) (link).[3]
VisionSpring: Eyeglasses to increase productivity across a range of occupations in Bangladesh	43x	THRIVE RCT reported +$12 increase in monthly income (+33%) (link to academic article; link to org summary). They estimate the lifetime benefit is $216 against a cost per eyeglasses of $5 (link)[4]
GiveDirectly: Unconditional cash transfers in Kenya	2.5x	A large RCT of UCTs in Kenya found positive spillovers to

[3] Bridges to Prosperity reports a 49% annual ROI on their website. However, this claim confuses ROI with internal rate of return (IRR). IRR is the discount rate that would make the present value of all future benefits equal to costs; this value is distinct from the annual return on an investment, which Bridges reports is $33k for a $100k bridge from an RCT in Rwanda. To estimate lifetime ROI, we used this impact estimate, the reported 40-year lifespan of the bridge, and a 10% discount rate. With 10% discounting, 40-year benefits are calculated as $354,979.54 compared to a $100,000 cost of the bridge, or ROI = 3.55x. This calculation does not include repair costs which are not reported (and not included in Bridges' own IRR). Bridges to Prosperity also conducted an RCT in Nicaragua, but the ROI was much lower in Nicaragua than in Rwanda due to lower density of households (and thus lower bridge usage). Other relevant links for BtP's cost-effectiveness, including independent researcher CE estimates and GiveWell's CE estimates, are here, here, and here.

[4] An earlier RCT of VisionSpring among tea-pickers in India (the PROSPER RCT) documented +22% increase in productivity (link), though did not report income and ROI. Thus our ROI estimate is based on the THRIVE RCT in Bangladesh.

		non-recipient households, and researchers estimated that the multiplier on total economic output was 2.5x (link)[5]
Interventions that support micro-entrepreneurs		
Village Enterprise: poverty graduation in Kenya and Uganda	5.3x	Based on positive consumption and assets effect in a large RCT of VE's programs in Kenya and Uganda, applying a 10% discount rate (link)
AVSI: Women's Income-Generating Support (WINGS) program in Uganda	4.7x	Based on an RCT of micro-enterprise support for war-affected communities in northern Uganda (link)
BRAC: Empowerment and Livelihood for Adolescents (ELA) program in Uganda	5.9x	Based on a large RCT of ELA clubs for young women in Uganda, assuming effects are sustained for 10 years (link)
Interventions that increase agricultural productivity		
One Acre Fund: Multifaceted support[6] for smallholder farmers across several sub-Saharan African countries	3.9x	SROI[7] estimates are from 2022 (link). 1AF estimates SROI each year from rigorous internal studies and documents fluctuations over time and across countries, usually in the range of 3-5x. However, it is unclear if these results are corroborated by external studies, which did not report SROI (link).
Raising the Village: Multifaceted support[8] for	5.4x	RtV claims 5.4x ROI based on a recent RCT in Uganda (link).

[5] Note that this multiplier is distinct from GiveWell's updated CE of cash transfers by 3-4x, which incorporates non-economic benefits (such as reductions in child mortality) converted to the same scale using the GiveWell team's moral weights (link).

[6] 1AF's core program consists of agricultural extension training (planting, crop health, soil health), inputs (fertilizers, seed, trees), and services (credit, crop insurance, cash crop purchase) (link)

[7] 1AF defines SROI as average incremental farmer profit/donor dollar. Costs include direct programming costs + indirect costs (HR,exec, finance, etc.) allocated to the core program. 1AF's time horizon for CEA is one season (i.e. 1AF does not model out impacts beyond one season, since most of the costs and inputs are recurring).

farming communities in Uganda		However, the working paper from this RCT had not been released by the time of this report, and so we were unable to verify this claim.

Social enterprise cost-effectiveness

While the MC program is highly cost-effective, it relies on donor funding to be replicated. WBR's social enterprise (the Buffalo Bicycle shop) offers an alternative path for expansion that is financially self-sustaining. However, a key question is whether bicycles sold through Buffalo shops have similar impact and cost-effectiveness as bicycles distributed through the MC program.

WBR has not commissioned an RCT to establish the impact of bicycles sold through Buffalo shops, but we can compare WBR's Know Your Customer (KYC) survey data from Buffalo shops with the MC RCT data and make reasonable inferences about the impact of social enterprise sales. WBR administered KYC surveys in 29 shops in Zambia (~95 customers surveyed per shop) around the same time as the MC RCT Year 1 endline survey (June-August 2024). **Table 2** compares MC LGMs with social enterprise customers in Zambia.

Table 2: LGMs in MC RCT vs social enterprise customers (Zambia KYC 2024)

Characteristic	**LGMs in MC RCT (endline, treatment group, 2024)[9]**	**Zambia Buffalo Shop customers (KYC surveys, 2024)**
Gender		
Male	31%	83%
Female	69%	17%
Age		
< 30yo	23%	24%
30-39yo	27%	36%
40-49yo	23%	25%
>= 50yo	27%	15%

[8] RtV runs a ultra-poor poverty graduation-style intervention specifically aimed at improving agricultural productivity for farming communities. The 24-month program includes agricultural and food security inputs for households and for the community; coaching and mentorship from extension workers; group-based training in agricultural and other practices; and formation of village savings and loans groups (link).

[9] Since KYC surveys were mostly conducted for existing customers rather than new customers (77% coming in for spare parts, rather than to purchase a new bicycle), we believe that social enterprise customers were more comparable to the RCT treatment group at endline, rather than to the treatment or control group at baseline.

Income (monthly, individual)		
< $50	72%	16%
$50-99	14%	16%
$100-199	9%	23%
$200-299	2%	13%
$300-399	1%	12%
$400-499	1%	11%
>= $500	2%	9%
Source of livelihoods		
Agri business	< 1%	34%
Formal employment	6%	20%
Casual employment	N/A	15%
Non-agri business	33%	16%
Subsistence farming	56%	15%
Other	5%	.%
Access to finance		
Mobile money	89%	77%
Formal bank or MFI	7%	34%
VSLA or SACCO	37%	17%
No access	4%	2%

Social enterprise customers tended to be wealthier, younger, more likely to be male, and more likely to be engaged in formal employment or agribusiness than MC LGMs; by design, the MC program targets vulnerable groups to receive bicycles. These characteristics and other insights from the KYC surveys may affect the impact of the bicycle on livelihoods. However, we believe that the balance of factors suggests that the impact of the bicycle may be similar or slightly greater for social enterprise customers than for MC LGMs. **Table 3** summarizes our reasoning.

Table 3: Factors that may affect the impact of a bicycle purchased at a social enterprise

Factors that may **increase** the impact of social enterprise bicycles, relative to MC	Factors that may **decrease** the impact of social enterprise bicycles, relative to MC	Factors that likely have **negligible** effect on the impact of social enterprise bicycles, relative to MC
Social enterprise customers have higher income (and likely higher wealth) than MC LGMs. The RCT treatment effect on assets is larger for households	Social enterprise customers are more likely to be male (83%) than MC LGMs (31%).[10] Treatment effects were greater for female LGMs than	Social enterprise customers are younger than MC LGMs. RCT treatment effects are similar for different age cohorts.

[10] Although social enterprise customers are predominantly male, they may be purchasing bicycles for a female relative, and so the gender split of actual bicycle users from social enterprise sales vs MC recipients may not be as large.

with higher baseline wealth ($p < 0.05$), though the consumption effect is similar across households. Social enterprise customers are more likely to work in agricultural businesses or formal employment than MC LGMs, who are more likely to engage in subsistence farming. Greater opportunities for using bicycles for business and employment may increase the potential for income generation. Social enterprise customers have a high revealed preference for a bicycle (they seek out and purchase a bicycle, despite the fact that a bicycle purchase represents a large portion of their disposable income), whereas LGMs were given bicycles if they met eligibility criteria. Revealed preference may correlate with higher use and/or more high-value use. Social enterprise customers may use the bicycle more because they paid for them rather than received them for free (sunk cost effect). In KYC surveys customers report using bicycles on average 6.5 days per week, vs potentially lower usage among MC LMGs (53% of MC LGMs reported using the bicycle 'daily' as of Endline 2, with the remaining reporting using the bike several times per week or less). This dynamic may be driven in part by gender differences, as male recipients report using the bicycle more frequently than female recipients in the MC RCT.	male LGMs ($p < 0.05$) Social enterprise customers likely live in less remote settings than MC LGMs (80% of social enterprise customers come from within the same district as the shop where they were surveyed, and shops tend to be in more urban or peri-urban locations). The value of the bicycle may be higher for users in more remote settings.	Social enterprise customers do not sign a contract promising to bring the bicycle in for regular maintenance, like LGMs do. At the same time, customers may have better access to spare parts through the shops than LGMs. Thus bicycle maintenance and durability may be similar.

At the same time as impact may be similar or slightly greater for social enterprise customers compared to MC LGMs, we project that the total societal cost per bicycle is likely similar (though with costs shifted from donor-funded programming to participant financing). On the one hand, Buffalo shops incur additional costs (relative to the MC program) related to store rental and upkeep and staff salaries, and most customers finance their purchases and incur financing costs. On the other hand, the MC program incurs additional programming costs, such as mobilization of BSCs, training of mechanics, community mobilization, and monitoring. We expect that these costs counterbalance and the cost per bicycle is similar for bicycles distributed under MC versus sold in Buffalo shops.

Thus we project that the ROI of bicycles sold in Buffalo shops is likely similar or slightly greater to the ROI of bicycles distributed in the MC program. Buffalo shops represent a critical channel for scale. However, an important caveat is that Buffalo shops and MC programs reach different populations, with the latter being more impoverished and vulnerable. WBR's innovative financing pilots for social enterprise customers, including pay-as-you-go programs, may be necessary to incentivize sales and expand the reach of the social enterprise to more vulnerable populations.

Cost-effectiveness of MC programs in other countries

The MC RCT was conducted in Mumbwa, Zambia from June 2023 to June 2025. Yet WBR implements programs in four other countries (Malawi, Kenya, Zimbabwe, Colombia), and may expand in the future. A key question is whether bicycles will have similar cost-effectiveness in these other countries.

To assess generalizability, we turned to WBR's internal monitoring data. WBR collected baseline and endline household income data from a sample of participants in each of the five MC programs implemented outside of Mumbwa. **Table 4** shows the results, with baseline and endline household income from treatment LGMs in the Mumbwa RCT in the top row:

Table 4: Average household monthly income at baseline and endline for other MC programs

	Baseline LCU	**Endline LCU**	**Change LCU, USD,[11] %**
MC RCT treatment LGMs, Jun 2023-Jun 2024 (N=595)*	ZMW 1,470	ZMW 1,845	+ZMW 375 +USD 14 +26%
Petauke, Zambia monitoring, Oct 2022-Nov 2023	ZMW 1,227	ZMW 1,788	+ZMW 561 +USD 28 +46%

[11] Conversions from LCU to USD use a rough average of exchange rate over the course of the monitoring period. Mumbwa RCT: 1 USD to 26 ZMW. Petauke monitoring: 1 USD to 20 ZMW. Hwange monitoring: no conversion (already in USD). Mumias East monitoring: 1 USD to 135 KSH. Zumba monitoring: 1 USD to 1,050 MWK. La Guajira monitoring: 1 USD to 4,500 COP

(N=159)*			
Hwange, Zimbabwe monitoring, Oct 2021-Nov 2022 (N=194)	USD 67	USD 109	+USD 42 + 63%
Mumias East, Kenya monitoring, Nov 2022-Nov 2023 (N=117)	KSH 29,486	KSH 54,823	+KSH 25,337 +USD 188 +86%
Zumba, Malawi monitoring, Nov 2022-Nov 2023 (N=161)	MWK 108,642	MWK 205,828	+MWK 97,185 +USD 93 +89%
La Guajira, Colombia monitoring, Aug 2022-Sept 2023 (N=115)	COP 380,321	COP 477,553	+COP 97,232 +USD 22 +26%

* winsorized at the 2.5th & 97.5th percentiles (otherwise not winsorized)

First, it is notable that the increase in income in the RCT treatment group was about half the increase in income in the most comparable MC program in Petauke, Zambia. We believe that this is explained by the timing of the study and the 2024 drought in Zambia. The Petauke MC data was collected shortly before the drought began in January 2024, whereas the MC endline data was collected when the effects of the drought would have been most severe. Indeed, we observed that among LGMs in the control group, income fell between baseline and endline (-ZMW 436) by roughly as much as it increased in the treatment group (+ZMW 375). We expect that in a more typical year, income levels would have registered little change in the control group, while rising twice as much in the treatment group, similar to the change observed in Petauke.[12]

Second, the baseline-to-endline increases in income in three of the other four countries are significantly greater than the increase in Zambia (either in Mumbwa or Petauke); in Colombia, the increase is similar in magnitude to the increase in Zambia. Although RCTs have not been conducted in these other countries, these monitoring results provide suggestive evidence that the impact of the bicycle in other countries may be similar or even larger than the impact measured in Zambia.

In terms of costs, we did not conduct a detailed cost exercise for each MC program in each country. However, we believe that the cost per bicycle recipient was similar. The primary cost drivers in our model were bicycle parts (45% of total program costs) and user repair costs (30% of total program costs). Bicycle parts were the same across countries, and according to WBR's

[12] Although Endline 2 MC RCT was collected during a comparatively 'typical' year, we use the 2023 and 2024 income estimates for this analysis, since all of the comparator monitoring estimates are from baseline and one-year endline.

monitoring data, repair costs were higher in Zambia than in Kenya, Zimbabwe, and Colombia, and similar in Malawi. The remaining 25% of costs (labor, warehouse, programming, monitoring, and VAT) may differ across countries, but any costs that are greater than costs in Zambia will be offset by lower repair costs, and thus are unlikely to explain large differences in total costs.

Thus, with impacts being similar or greater in other countries, and costs being similar, we project that the ROI of MC programs in other countries will be similar or slightly greater to what we calculated from the Mumbwa RCT.

3. Education programming cost-effectiveness

We estimate that giving bicycles to schoolgirls in Grades 5, 6, and 7 through the Bicycle Education and Empowerment Program (BEEP) in Zambia increases additional schooling by 33 days over five years, per bicycle distributed in the program. Equivalently, we estimate that additional schooling increases by 17 days per $100 invested in BEEP.

Benefits calculation

To estimate the impact of the bicycle on education, we drew on results from the updated BEEP RCT paper by Fiala et al (2025) (link).[13] In this study, the authors estimated that girls in treatment schools attended 7.9 more days of school in 2019 than girls in control schools.[14] Assuming that the bicycle remained usable for 5 years (similar to our assumption for bicycles distributed in the MC programs), and that girls remained enrolled in school (which is plausible given high enrollment rates in Zambia, particularly since the free universal secondary education policy was implemented in 2022), then girls who received bicycles would attend approximately 33 more days of school than girls who did not receive bicycles (after applying a 10% annual discount rate).[15]

It is important to note that this cost-effectiveness calculation is focused on the number of days of schooling and does not account for other effects attributable to bicycle ownership. Some of these outcomes were documented in the initial RCT endline survey (2018), while other outcomes were documented in analysis of follow-up administrative school records (2019-2021), and in a long-term

[13] This paper was downloaded from one of the author's websites (Nishith Prakash) (link). An up-to-date version can be found here (link).

[14] Take-up of bicycles was almost 100% in BEEP treatment schools (similar to MC treatment LGs and CHWs), and so we refer to the intent-to-treatment sample ("girls in treatment schools") and the treatment-on-the-treated sample ("girls who received bicycles") interchangeably.

[15] The study authors conducted their own cost-effectiveness analysis and concluded that the intervention delivered 0.0283 years of schooling per $100 spent (equivalent to 7.9 additional days of schooling in a 180-day school calendar), comparing favorably with other interventions attempting to increase schooling, such as conditional cash transfers, information and incentive-based interventions, and grants or inputs to improve school quality (Fiala et al, 2025). However, the authors assumed that the bicycles conferred only one year of benefits. Instead, we assumed five years of benefits (with a 10% discount rate), which we believe is a more accurate reflection of the durability of bicycles and usage among bicycle recipients.

survey in RCT communities (2022).[16] Effects of BEEP on outcomes besides attendance included the following:

- **Punctuality**: Girls who received bicycles were more likely to arrive at school on time: girls in the treatment group were late on average 1.45 fewer days per week than girls in the control group. Thus, receiving a bicycle increased the amount of instructional time that girls received, separate from reduced absenteeism.
- **Dropout**: Although girls were 10 percentage points less likely to drop out of school four years after bicycles were distributed (Fiala et al, 2025), by 2022 girls in treatment and control communities had equivalent years of educational attainment (Garcia-Hernandez et al, 2025). The authors attributed the null effects on educational attainment to the roll out of Zambia's universal secondary education policy in January 2022. Since the short-run dropout effects did not affect educational attainment in the medium term, we did not include dropout in our calculation of additional schooling. On the other hand, effects on dropout may persist in other settings that do not have a similar universal secondary education policy.
- **Safety**: Girls with bicycles were 22% less likely to be teased or whistled at on the way to school, and 38% less likely to miss class or leave school early due to safety concerns. By 2022, girls in treatment communities were 10 percentage points less likely to experience domestic violence. These are important outcomes achieved by BEEP that should be considered in conjunction with the benefits of additional schooling.
- **Economic outcomes:** In the 2022 follow-up, the BEEP RCT authors documented large improvements in the material well-being of girls who received bicycles, even though improving livelihoods was not an explicit goal of BEEP. Specifically, the authors documented an effect size of 0.78 SD on a socioeconomic index consisting of a list of common household assets. These results were consistent with BEEP endline survey results showing that bicycles were widely shared within households (57% of girls reported sharing bicycles with other household members), and with our MC RCT results showing that bicycles had a large effect on household livelihoods.
- **Self-reported empowerment, early marriage, and teenage pregnancy**: In the short-run, bicycles increased the overall index of female empowerment by 0.12 SD, driven by improvements in locus of control, bargaining, pro-sociality, and self-image. These effects persisted in the medium-term follow-up. Yet at the same time that girls in treatment communities reported greater empowerment, they were also 8 percentage points more likely to be married before age 18, and 11 percentage points more likely to be currently or previously pregnant, than girls in the control group. The authors attempted to address these surprising and seemingly contradictory results by explaining early marriage and pregnancy as a form of realized empowerment: "the evidence points to upward economic mobility as a plausible mechanism, improving girls' attractiveness in local marriage markets and facilitating better partnership matches. The combined improvements in bride price, household welfare, and tentative reductions in partner violence suggest that treated girls were more likely to enter higher-quality unions. This pattern is consistent with assortative

[16] Due to IRB issues, the long-term follow-up did not survey the same sample of girls as the 2017 baseline and 2018 endline, but instead drew a new, independent sample from eligible girls in treatment and control communities.

matching dynamics, wherein girls with greater assets or status are better able to attract well-resourced partners." (Garcia-Hernandez et al 2025, pp. 12-13). Given these surprising results that point toward complex manifestations of empowerment that are mediated by local cultural norms, it is unclear how to quantify and interpret empowerment alongside our top-line outcome of additional schooling.

Cost calculation

We estimated that BEEP costs per bicycle were $197.85 over five years. ***Figure 3*** is a screenshot from our CE model that shows aggregated costs; line-item costs are available in the "Education-costs" tab of the spreadsheet.

Figure 3: Costs calculation, Education CEA

Costs	
One-time costs per bicycle recipient	$106.71
Annual recurring costs per bicycle recipient	$19.17
Number of years recurring costs are sustained	5.00
Reduced Year 1 repair costs	-$6.36
Inflation rate	10.94%
Discount rate	10.00%
Total costs	***$197.85***

These costs were reported by WBR from the year of the BEEP RCT (2017-18), with the exception of user repair costs, which we assumed were similar to repair costs in the MC program, deflated to 2018 dollars. If we inflated these costs over 5 years to make them comparable with MC costs, then the total cost per bicycle distributed in BEEP would be $375.41.[17] These costs are somewhat higher than the per-bicycle cost in the MC Mumbwa program ($216.81). We attribute the difference to parts and labor costs that increased slower than the rate of inflation, and to significantly higher monitoring costs in BEEP than in MC (mainly due to the smaller number of bicycles distributed through BEEP compared to MC).

Lifetime earnings and cost-benefit analysis

We tentatively extended the impacts of BEEP bicycles on schooling to additional lifetime earnings. To do so, we used a Mincer equation, which relates average monetary returns to additional years of school. Mincer equations are commonly applied in empirical economics, but they come with the heavy caveat that statistical estimates reflect correlations between educational attainment and income rather than causal relationships. There are likely omitted variables that mediate the relationship between years of education and lifetime earnings.

[17] This calculation uses inflation data from 2019-2023 from the World Bank inflation database. 197.85*1.092*1.157*1.220*1.110*1.109 = 375.41

With that caution in mind, we referred to Montenegro & Patrinos (2023), who applied a Mincer equation to data from Zambia's 2010 Living Standards Measurement Study (LSMS). The authors found that an additional year of secondary school for women in Zambia was associated with an 8.1% increase in income. In the 2010 LSMS report (link), the monthly per capita income of female-headed households[18] in rural areas was ZMK 165,000, or approximately $41 in 2010 USD,[19] which would be equivalent to ~$76 in 2018 USD.[20] If we extrapolate $76 per month to 42 years of active work,[21] then lifetime earnings for women in Zambia in 2018 USD were roughly (76 per month * 12 months * 42 working years) = $38,304. Increasing this amount by 8.1% implies that an additional year of schooling for women in rural Zambia was equivalent to approximately $3,103 in USD 2018. Girls who received bicycles attended 33 more days of school, or 0.183 additional years (using a 180-day school calendar), so the Mincerian projected returns to receiving a bicycle can be estimated as 3103∗0.183=$568, or ~2.9x the cost per bicycle distributed.

In addition to the increase in lifetime earnings, it is important to keep in mind that bicycles distributed through BEEP directly enhanced household livelihoods, as documented in the 0.78 SD effect on the socioeconomic index. While we cannot monetize this socioeconomic benefit (since the BEEP RCT data did not include valuations for household assets), including this benefit would increase the ROI of bicycles distributed through BEEP beyond 2.9x, though still likely not as high as the ROI of bicycles distributed through MC (14.7x).

Comparability with peer programs

We estimate that per $100 invested in BEEP, additional schooling increases by 17 days, or 0.09 years using a 180-day school year. This estimate is comparable to other programs involving subsidies or transfers to increase educational attainment. For instance, in a systematic review of RCTs of programs aimed at improving school attendance, researchers at J-PAL found that conditional cash transfers and scholarships to attend school in Kenya, Malawi, Mozambique, Ghana, and Mexico had impacts ranging from 0.01 to 0.17 additional years of schooling per $100 (J-PAL Policy Bulletin, 2017, link). On the other hand, interventions aimed at improving student health - such as deworming and iron fortification - were much more cost-effective approaches to increasing schooling (> 1 additional year per $100), whereas interventions to improve school quality - such as monitoring teacher attendance or hiring contract teachers - had negligible impacts on attendance and thus lower cost-effectiveness.

Cost-effectiveness of WBR's education programs in other countries

The BEEP RCT was conducted in three districts in Southern Province, Zambia. However, WBR implements education programs in their other four countries of operations (Malawi, Kenya, Zimbabwe, Colombia). Similar to questions around the generalizability of the cost-effectiveness of

[18] The LSMS 2010 report does not report male vs female wages, so we use per-capita income of female-headed households as a proxy for per-capita female income.
[19] Prior to revaluation, the exchange rate was approximately ZMK 4,000 to 1 USD.
[20] Annual inflation in Zambia from 2010 to 2018 was about 8%.
[21] We assume that working years are from 18 years old (graduation from secondary school) to 60 years, which the standard age of retirement per the Zambia Public Services Pensions Act (link).

WBR's livelihoods-focused programming, it is unclear whether these education estimates would generalize to other contexts.

To assess generalizability, we turned to monitoring data collected by WBR on their education programs (link). Although this data is more limited than data on economic livelihoods, in general we observed that education-related outcomes are similar in cross-country monitoring data as in the BEEP RCT data. For instance, in the BEEP RCT, girls who received bicycles experienced shorter commute times by 35 minutes relative to the control group. In WBR's monitoring data, commute times for girls receiving bicycles fell by a similar amount: 39 minutes (Zambia), 34 minutes (Kenya), 40 minutes (Malawi), and 33 minutes (Colombia). In the BEEP RCT, bicycles increased perceived safety by 0.11 SD, whereas in WBR's monitoring data, the percent of children who reported feeling safe increased significantly in all countries after receiving bicycles.

While this evidence suggests that bicycles given through education programs may have similar impacts (and cost-effectiveness) across countries on education outcomes, the evidence on secondary socioeconomic effects is less clear. For instance, girls in Zambia were more likely than girls in other countries to report sharing the bicycle with other household members. Moreover, girls in Zambia were more likely than girls in 3 of the other 4 countries to report using the bicycle to travel to health facilities or fetch water, and more likely than girls in 2 of the other countries to report using the bicycle to travel to the market. While these indicators provide limited visibility into the livelihoods impact of bicycles distributed through education programs, we consider it suggestive that the knock-on economic effects of bicycles for schoolgirls may vary significantly across contexts.

4. Health programming cost-effectiveness

We estimate that giving bicycles to community based volunteers through the Mobilized Communities program in Zambia enables CBVs to serve 2,811 additional clients per bicycle distributed. Equivalently, CBVs serve 1,297 additional clients per $100 invested in the program.

To estimate the impact of the bicycle on health outcomes, we drew on results from the first and second years of the MC Zambia RCT (link). Specifically, the MC RCT data showed that CBVs who received a bicycle reached 115.4 additional clients per month in the first year, above the 183.8 clients per month served by control CBVs, or +63%.[22] By the second year, however, the average number of additional clients per month served by treatment CBVs dropped to 37.5, or +52% relative to the control group, which also reported serving fewer clients per month. We attribute this decline both to changes in the external environment (fewer CBV visits to households) as well as shifts in how CBVs used bicycles: compared to Year 1, CBVs in Year 2 were more likely to use bicycles for livelihoods purposes in addition to fulfilling their health assignments. As a result, the impacts of bicycles on earnings and consumption for CBVs were significantly larger in Year 2 than in Year 1.

[22] CBVs also reported transporting sick individuals to clinics on their bicycles an average of 6 times per month at Endline 2 (down from 15 times per month at Endline 1). We assume that CBVs included these instances in their estimates of the number of clients reached in the previous month, though it is possible that these activities were in addition to their normal activities.

Assuming CBV productivity, in terms of the number of patients reached, declines after the first year and plateaus for the next four years, and applying a 10% annual discount rate, we projected that CBVs with bicycles will reach 2,811 additional clients over five years. Compared to a cost per bicycle of $216.81 (including the bicycle itself, repair costs, and costs associated with MC programming), we arrived at 1,297 additional clients per $100 invested in the program.

While this increase in CBV productivity is impressive, it is unclear how productivity translates to health outcomes. In general, community-based health worker programs are associated with cost-effective improvements in health outcomes in LMICs. One systematic review covering 33 studies of CHWs, mostly in sub-Saharan Africa, found that CHW programs were cost-effective at improving health outcomes compared to alternative healthcare models such as facility-based care, though cost per beneficiary ranged by more than four orders of magnitude across countries (O'Donovan et al, 2025, link). A second meta-analysis, which included studies of CHW programs in Zambia, Malawi, and other LMICs, found that CHW programs cost-effectively reduced neonatal and infant mortality and improved breastfeeding practices, especially when CHWs were involved in home visits and community mobilization (Lassi et al, 2016, link).

Given the cost-effectiveness of CHW programs, it is plausible that increasing CHW or CBV productivity, as bicycles in the MC program do, could lead to improved health outcomes. It may be particularly important to increase CHW productivity in places like rural Zambia where increasing demand for healthcare is outpacing increases in supply: one study in Western Province, Zambia projected that health facilities per 10,000 population will fall by nearly half by 2032 (Chiarot et al, 2025, link). However, the evidence on the effects of CHW productivity and performance on health outcomes is limited and mixed. One study in Uganda that tested performance-based incentives for CHWs found increased home visits and better maternal and child health practices (Björkman Nyqvist et al, 2019, link). An earlier systematic review of 14 evaluations of interventions to improve CHW performance generally found improved quality of care and patient outcomes, though also suggested that high caseloads may reduce CHW effectiveness (Ballard et al, 2017, link). Other researchers have argued that interventions that only increase CHW workload without providing additional support may backfire (e.g. Rowe et al, 2005, link). However, a key component of increased workload cited by CHWs across studies is the lack of access to transport (Astale, Abebe, & Mitike, 2023, link); providing CHWs bicycles may make this increased workload more sustainable.

During Endline 2, we attempted to estimate the effects of increased CBV productivity on health outcomes by examining correlations between the number of bicycles distributed to health facilities and administrative data from those facilities. However, the administrative data that we received - including facility registers that recorded the number of family planning, HIV tests, and malaria tests administered, and DHIS2 data that contained monthly records of family planning uptake, antenatal and delivery outcomes, child health outcomes, child vaccination coverage, HIV outcomes, and malaria outcomes - was incomplete and contained few entries that could be merged with the RCT data. Specifically, the administrative data were missing records for a large fraction of CBVs, facilities, and time periods, and missingness varied across datasets, which prevented us from conducting unbiased and precise estimation. We describe the data processing, analytical models, and results from analyzing the administrative health data here:

Given issues with the available administrative health data, we encourage WBR to explore options for conducting an evaluation of CBVs that involves independent and primary data collection for health outcomes. To our knowledge there have not been any studies that have rigorously examined the impact of relaxing transportation constraints on CBVs, and we believe that such a study would yield valuable evidence to inform WBR's programming for CBVs as well as the health sector's approach to supporting CHWs.

Conclusion

The results of this cost-effectiveness analysis underscore the powerful role that bicycles can play in improving livelihoods, education, and health outcomes in low-resource settings. Our analyses show that bicycles distributed through the MC program have a strong ROI, bicycles distributed through the BEEP program increase access to school cost-effectively, and bicycles given to CBVs lead to promising gains in health worker productivity. Monitoring data extends these findings, suggesting that bicycles distributed in other programs and countries, and in other models such as the Buffalo social enterprises, may achieve similar or greater cost-effectiveness. Year 2 results from the MC RCT reinforce the sustainability of the positive impacts of bicycles. These findings provide proof-of-concept for the potential for WBR to achieve scalable impact through both donor-funded and market-based channels.

References

Astale, T., Abebe, T., & Mitike, G. (2023). "Workload and emerging challenges of community health workers in low- and middle-income countries: A mixed-methods systematic review." PLOS ONE 18(3): e0282717. (link)

Ballard, M., & Montgomery, P. (2016). "Systematic review of interventions for improving the performance of community health workers in low-income and middle-income countries." BMJ Open, 7 (10). (link)

Bandiera, O., Buehren, N., Burgess, R., Goldstein, M., Gulesci, S., Rasul, I., & Sulaiman, M. (2020). "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa." American Economic Journal: Applied Economics 12 (1): 210-59. (link)

Björkman Nyqvist, M., Guariso, A., Svensson, J., & Yanagizawa-Drott, D. (2019). "Reducing Child Mortality in the Last Mile: Experimental Evidence on Community Health Promoters in Uganda." American Economic Journal: Applied Economics 11 (3): 155–92. (link)

Blattman, C., Green, E., Jamison, J., Lehmann, M.C., & Annan, J. (2016). "The Returns to Microenterprise Support among the Ultrapoor: A Field Experiment in Postwar Uganda." American Economic Journal: Applied Economics 8 (2): 35-64. (link)

Brooks, W., & Donovan, K. (2023). "Measuring return on investment for a footbridge in Nicaragua and Rwanda." Mimeo. (link)

Chiarot, C., Janes, C., Abdullah, A.Y.M., Goma, F., Phiri, M., Singini, D., Zulu, R., & Butt, Z. (2025). "Evaluating the concept of access as a critical dimension of universal health coverage in the context of rural communities of Western Province, Zambia." SSM - Health Systems, Volume 5. (link)

Dhaliwal, I., Duflo, E., Glennerster, R., & Tullock, C. (2013). "Comparative cost-effectiveness analysis to inform policy in developing countries: A general framework with applications for education." J-PAL publication. (link)

Dickson, R., Gosnell, G., Hu, J., Basnak, M. (2023). "Livelihood interventions: overview, evaluation, and cost-effectiveness." Rethink Priorities publication. (link)

Eggers, D., Haushofer, J., Miguel, E., Niehaus, P., & Walker, M., (2022). "General Equilibrium Effects of Cash Transfers: Experimental Evidence From Kenya." Econometrica 90 (6): 2603-2643. (link)

Fiala, N., Garcia-Hernandez, A., Narula, K., & Prakash, N. (2025). "Wheels of change: Transforming girls' lives with bicycles." Working paper. (link)

Garcia-Hernandez, A., Prakash, N., & Steinert, J.I. (2025). "The empowerment paradox? The long-run impact of a cycling program for girls in Zambia." Working paper. (link)

GiveDirectly (2024). "Direct cash looks 3-4x more cost-effective in a new GiveWell assessment." GiveDirectly post. (link)

GiveWell (2022). "Bridges to Prosperity." GiveWell charity review. (link)

GiveWell (2024). "GiveWell's cost-effectiveness analyses." GiveWell Website. (link)

J-PAL Policy Bulletin (2017). "Roll Call: Getting Children Into School." Cambridge, MA: Abdul Latif Jameel Poverty Action Lab. (link)

Lassi, Z., Kumar, R., & Bhutta, Z. (2016). "Community-Based Care to Improve Maternal, Newborn, and Child Health." In: Black RE, Laxminarayan R, Temmerman M, et al., editors. Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; Chapter 14. (link)

Livelihood Impact Fund (2025). "How we think of ROI." LIF website. (link)

Montenegro, C, & Patrinos, H. (2023). "A data set of comparable estimates of the private rate of return to schooling in the world, 1970-2014." International Journal of Manpower 44:6: 1248-1268. (link)

O'Donovan J, Baskin C, Stansert Katzen L, Ballard M, Kok M, Jimenez A, et al. (2025). "Costs and cost-effectiveness of community health worker programs focussed on HIV, TB and malaria infectious diseases in low- and middle-income countries (2015–2024): A scoping literature review." PLOS Glob Public Health 5(5): e0004596. (link)

One Acre Fund (2025). "How and why we use rigorous evaluations—such as RCTs and diff-in-diffs." One Acre Fund Website. (link)

Raising the Village (2025). "Our Impact". RtV Website. (link)

Rowe, A., de Savigny, D., Lanata, C., & Victoria, C. (2005). "How can we achieve and maintain high-quality performance of health workers in low-resource settings?" Lancet, 366 (9490):1026-35. (link)

Sebele, M., Mukanu, M., McManus, J., Ahmed, K., & Sambu, W. (2024). "Mobilized Communities Impact Evaluation: Endline Report." IDinsight publication. (link)

Sehrin, F., Jin, L., Naher, K., Das, N.C., Chan, V.F., Li, D.F., Bergson, S., Gudwin, E., Clarke, M., Stephan, T., & Congon, N. (2024). "The effect on income of providing near vision correction to workers in Bangladesh: The THRIVE (Tradespeople and Hand-workers Rural Initiative for a Vision-enhanced Economy) randomized controlled trial." PLoS One. (link)

VisionSpring (2025). "PROSPER RCT." VisionSpring website summary. (link)

World Bank (2025). "International Financial Statistics database: Inflation, consumer prices (annual %) - Zambia." (link)

World Bicycle Relief (2024). "Bicycle ecosystem & cost of ownership estimates: WBR Mobilised Communities." Internal slidedeck.

World Bicycle Relief (2024). "Bicycle Impact: Education. Evidence from RCT and WBR Assessments." Internal slidedeck.

World Bicycle Relief (2024). "Know Your Customer Survey - 2024." Internal report.

World Bicycle Relief (2025). "Inputs for CEA modelling." Internal spreadsheet and document.

Zamstats (2011). "Living Conditions Monitoring Survey Report 2006 and 2010." Central Statistical Office, Zambia. (link)

Appendix 1: Insights from stakeholder interviews

In preparation for our CEA, we interviewed WBR staff and key board members to inform our planned approach and generate insights about how CE is reported across the sector. Notes from

these interviews can be found here: WBR CEA-Stakeholder Interviews. Interviewees are listed in **Appendix Table 1**

Appendix Table 1: List of key stakeholder interviews

Stakeholder	Organization & role	Interview date/time
WBR internal working group	Dave Neiswander (CEO), Jeff Bosken (CFO), Allie Buckler (Corporate Controller), Dawn Moen (Executive Director, Development, Marketing, Communications), Andrew Batchelor (Institutional Markets Lead), Lawrence Banda (Monitoring and Database Manager), Andy Samways (VP, Product Development), Sean Granville-Ross (Executive Director, Programs), Maureen Kolenyo (Regional Director, East Africa), Alisha Myers (Global Director of Strategic Information and Innovation), Winnie Sambu (Global Research Lead)	May 15, 2025, 7am PDT
WBR leadership	Dave Neiswander (CEO), Jeff Bosken (CFO), Allie Buckler (Corporate Controller)	May 16, 2025, 11am PDT
Stan Getui	MasterCard Foundation, Head of Capacity Development and Ecosystem Building, WBR Board Member	May 27, 2025 4:15pm EAT/6:15am PST
Anna Marie Harling	Co-Impact, Managing Director of Philanthropic Collaboration, WBR Board member	May 28, 2025 7:30am PDT
John Grove	The Global Fund, Chief Evaluation & Learning Officer, WBR Board member	Jun 3, 2025 4pm CET/7am PDT
Cassandre Pignon	Cartier Philanthropies, Head of Programmes	Jun 4, 2025 4pm CET/7am PDT

We summarize key takeaways from these stakeholder interviews below:

1. **Cost-effectiveness is central, but complex**: Stakeholders support using CE metrics but caution against single-number summaries, especially when systemic change is a key goal.
2. **Program model matters more than bike design**: Stakeholders emphasized the importance of scalable, system-embedded delivery models, especially government partnerships, over trying to reduce bike costs, which might compromise durability and brand value.
3. **Government buy-in is essential for scale**: Several interviewees emphasized the need for cost-effectiveness data that aligns with government priorities and metrics to make a compelling policy case.

4. **Funders vary in their CEA expectations**: Some, like LIF or GiveWell, seek rigorous cost-effectiveness metrics, while others (e.g., Co-Impact, Cartier) prioritize practicality, alignment with mission, and evidence that programs can be embedded in systems and sustained post-philanthropy.
5. **Consumption is preferred over income as a livelihood outcome**: Stakeholders generally endorsed household consumption as a more reliable metric than income, due to self-reporting and variability challenges.

Appendix 2: How sector leaders calculate and report cost-effectiveness

Below we list some of the resources that we used when designing our CEA methods:

- J-PAL's guide to CEA (link)
  - Detailed guidance on cost data. Marginal cost to run program. Includes all costs, not just to implementer, but also to participants
  - Outcome-agnostic
  - Uses 10% discount rate across the board
- Livelihood Impact Fund's approach to ROI (link)
  - ROI: Each $1 invested leads to $X increase in income for beneficiaries (link)
  - Funds programs with >5x ROI over 5 years, which they also equate to 5x cash (i.e. assumes that $1 invested in UCT → $1 increase in beneficiary income)
  - Uses 5 year time horizon for estimating ROI
  - Costs: considers both implementation costs & costs to participants
- GiveWell's approach to CEA (link),
  - GW's definition of CE (link)
  - GW's detailed internal guide to CEA (link)
  - Benchmarking to cash, "10x (CE of) cash" (link)
  - Converts all outcomes to lives saved, applying moral weights to compare livelihoods & health programs
  - Adjusts estimates downards for uncertainty, e.g. external validity of previous IE effects
  - Always does own CEA for prospective grants (link)
- Mulago/Kevin Starr on CEA (link)
  - Considers additional income stream over 3 years attributable to intervention
  - GiveDirectly "essentially a wash" (costs = benefits)
- IDinsight's CEA bootcamp lesson for new staff (link)
  - IDinsight CE strategy blogpost (link)
- Spring Impact rough costs calculator (link)
- IRC's approach to cost-efficiency & cost-effectiveness analyses (link)
- One Acre Fund's SROI approach (link)