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Measuring the Jobs Effects of Footbridge Access Interventions: An Application in Lesotho

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1. Introduction

Lesotho is a small lower-middle-income country located in the south of the African continent, with all its territory landlocked in South Africa. With a population of 2.2 million, the country's geography is mainly characterized by mountains. Since 2017 its economy has contracted, registering consecutive negative annual gross domestic product (GDP) growth numbers. Between 2017 and 2020, the real GDP accumulated contraction is around 14 percent. These results are sustained by the persistent political instability observed in the country and were reinforced by the COVID-19 pandemic effects. As a result, the unemployment rate has increased, reaching 24.6 percent in 2021. This adverse economic scenario has not contributed to reducing poverty and alleviating the country's elevated income inequality (World Bank 2021b).

In this context, the World Bank has supported the country in several projects intended to overcome development challenges. The actual portfolio comprises 11 projects covering key social areas and infrastructure sectors. Among these projects, the Lesotho Transport Infrastructure and Connective Project (LTIC) intends to improve access to social services and markets in targeted rural areas through the construction of 41 footbridges in areas cut from road access, especially during the rainy seasons.[2]

The Lesotho road network is unevenly distributed over the country, constraining the economic growth of isolated areas, particularly in highlands with high agricultural potential. Despite the investments made in recent years to expand and rehabilitate urban and rural road networks, they are still concentrated on 25 percent of the territory, covered mainly by lowlands and foothills. In the highlands, bridle paths, river crossings, and footbridges have an essential role in providing access to main roads, basic services, and connecting villages. They are especially crucial during rainy seasons when floods and landslides limit the connectivity of several communities to markets and social services, such as schools and health care facilities (World Bank, 2017). Therefore, the footbridges constructed under the LTIC project are expected to have a decisive impact on those areas by enhancing connectivity to essential infrastructure services and agricultural and labor markets.

1 This report is part of the World Bank IDA19 Policy Commitment to better understand how to measure indirect jobs impacts of development interventions and policies. It is an exploratory exercise on the suitability of estimation methodologies. The results from this report are not official assessments of the performance of the interventions or policies being analyzed and should not be quoted as such.

2 The Project Appraisal Document (World Bank 2017) initially informed that the program intended to construct approximately 35 footbridges in communities located in areas with infrastructure restrictions. As of December 2021, the Implementation Status and Results Report (World Bank 2021a) updated this number to 41 programmed footbridges and informed that 21 were successfully constructed at that date.

This report aims to estimate ex ante outcomes related to this project, especially focusing on indirect jobs impacts—that is, jobs beyond the construction and maintenance of the footbridges. The estimation strategy is to utilize the data available in the Lesotho's Continuous Multipurpose Household Survey/Household Budget Survey 2017–2018 following three steps. The first step consists in identifying through the survey beneficiary households and individuals of the 19 footbridges initially planned to be constructed under the project using geospatial data.[3] The second step is to econometrically estimate how the existing footbridges in the country are associated with the project's intended outcomes, especially jobs, in the same regions where implementation is contemplated. Finally, in the third step, the estimates obtained in the second step are applied to the beneficiary households identified in the first step to evaluate the expected project's results.

To identify beneficiary households (first step) and households with footbridge access before project implementation (second step), we use the distance between individuals' residences and the footbridge locations. In the first step, the geographic coordinates of each household interviewed in the survey and the location of the19 footbridges that were initially planned are used to calculate the distances and define the beneficiaries, as detailed in sections 3 and 4. For the second step, a Lesotho Road Map containing all footbridges existing in the country before the program was initiated to georeference the footbridges' locations. The QGIS geographic information software permitted the use of geographic information presented on the map to extract the footbridge coordinates and calculate the distances between each household and existing footbridge (section 5).

The main estimates indicate that the expected results from the project include a reduction in the travel time to essential social services, a higher probability of access to superior quality remunerated jobs, poverty reduction, an increase in per capita consumption, and an increase in the agricultural production share destinated to sales. Although the literature on the subject is not extensive, the results are aligned with the principal results estimated for similar interventions, as observed in Thomas et al. (2021) and Brooks and Donovan (2020).

The document is organized as follows. Section 2 provides a Theory of Change for the project, discussing the project interventions and the expected outcomes. Section 3 presents the data information and definitions used in this report. Section 4 describes the methodology used to identify benefitting individuals and households by the project, and Section 5 the methodological approach to identify households and individuals with access to footbridges before the project implementation. Section 5 also describes the different restricted datasets considered in the estimates. Section 6 presents the second step estimates and discusses the results. Finally, Section 7 provides ex ante estimated results for the project and concludes.

[3] The locations of the 19 footbridges considered in this analysis were determined following a prioritization exercise carried out by Lesotho's Government. The exercise respected the following criteria: (a) frequency and duration of floods (how long it takes for the river to subside and allow traffic after heavy rains); (b) population served; (c) pedestrian travel time to the nearest alternative crossing; (d) use of the footbridges (access to basic services, markets); (e) number of drowning incidents in the past five years; (f) accessibility to vehicles (to assess the difficulty in shipping in materials to the construction site); and (g) the type of footbridge required (World Bank 2017, item 58).

2. Theory of Change

Figure 1 summarizes the theory of change of the LTIC project for its 'Component 1: Improving Infrastructure Access', the focus of this report analysis.[4] The footbridges constructed under the project are expected to reduce or eliminate transportation constraints, especially in highlands during the rainy seasons when those populations are isolated from markets and social services.

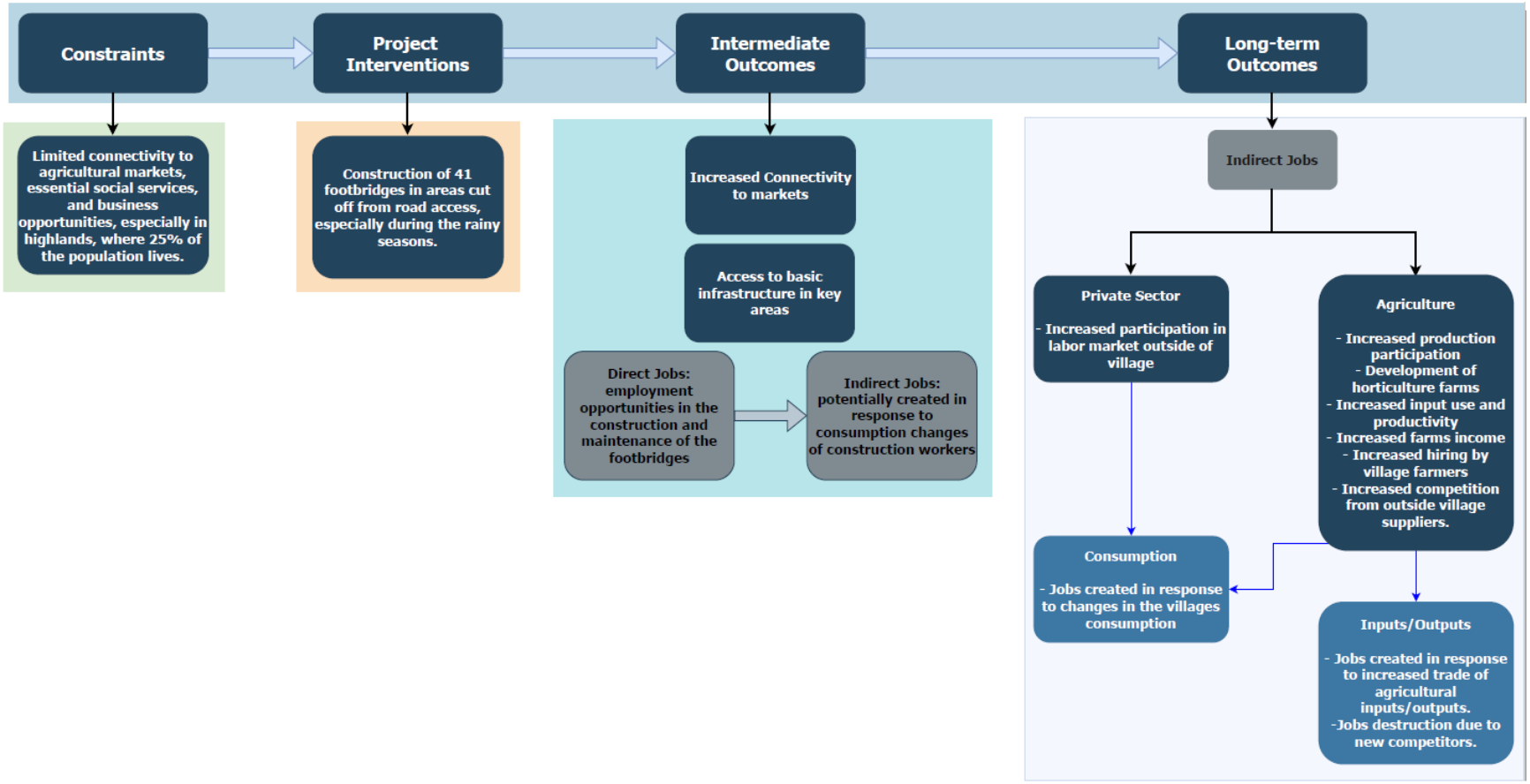
Therefore, through the project's interventions, the intermediate outcomes expected from the project regarding Component 1 are the improvement of the access for the benefited population to agricultural and job markets and essential infrastructure services. These intermediate results combined must result, in the long-term, in higher access to job positions outside the benefited villages, increasing the income and consumption in the benefited areas. In the agriculture sector, changes in the supply chain can be anticipated. On the one hand, the demand shock creates new business opportunities, raising the production destined for sale relative to consumption and increasing hiring by village farmers. On the other hand, it is possible that local producers were protected from competition before the project's intervention due to the high transport costs faced by outside suppliers to attend the village's markets. Once the new footbridges alleviate competition barriers, their production and profits are reduced, decreasing the job opportunities for the local communities. Hence, the results estimated in this report must capture net impacts on indirect jobs as a result of the project's interventions.

This chain of causal results has the potential to induce additional indirect impacts on jobs due to backward supply chain factors and consumption spillover factors. The first effect arises from the expected increasing trade in agriculture inputs, creating job opportunities in this market in response to the increased demand for production inputs. The second effect is directly related to the rise in the income per capita in the benefited villages, increasing demand for different goods and services and, consequently, creating new jobs.

Sections 6 and 7 assess the impacts related to those outcomes that can be expected from the project. In addition, the sections evaluate effects on job quality associated with the availability of footbridges in the project's target areas.

[4] The 'Component 1: Improving Infrastructure Access' is the main project component and has an estimated cost of US$ 9.2 million reported in the Project Appraisal Document (World Bank 2017), representing 50.3 percent of the total project financing.

Figure 1 - Lesotho Transport Infrastructure and Connective Project: Theory of Change



3. Data and Definitions

3.1 Data Sources

3.1.1 Continuous Multipurpose Household Survey/Household Budget Survey (CMS/HBS) 2017–2018

The primary data source used in the analyses presented in this report is the CMS/HBS administered between January 2017 and February 2018 by the Ministry of Development and Planning of the Lesotho Government. The survey provides socioeconomic information of 4,295 households and 17,289 individuals distributed in the 360 census enumeration areas around the country. Appendix IV presents the variables and indicators constructed using the CMS/HBS data and considered in the outcomes' estimates.

3.1.2 Transport, Infrastructure and Connectivity Project – Environmental and Social Management Plan (ESMP), 2017

The geographic location information regarding existing footbridges and the 19 initially planned footbridges under the project are sourced from the Environmental and Social Management Plan Report conducted by the Ministry of Public Works and Transport of the Lesotho Government in 2017 (see Appendix II). The report identifies activities, methods, and mitigation measures used to control and minimize the social and environmental impacts related to the footbridges' construction and operation.

3.2 Definitions

The methodology followed in the present report is based on information and data collected before the project implementation. In this regard, it is important to establish comprehensible definitions for the terms that will be referred to in the following sections.

Definition 1. ***Footbridge Impact Zone***: *Possible impact area of a footbridge. This area is delimited by a radius of 5 km around a footbridge location.*

Footbridges intend to benefit individuals whose primary transportation method to reach social services and markets is by walking. Hence, the targeted population needs to be reasonably close to the footbridges to be affected by the project.[5] Following this assumption, it is necessary to establish an area around each footbridge that delimits its influence. The threshold used in this analysis to delimit the area covered by a footbridge is a radius of 5 km around each footbridge's location. This threshold is consistent with the baseline information collected in some of the villages targeted by the LTIC project. Although we do not have access to baseline information regarding the first 19 project footbridges considered in the estimates, we could consult the Baseline Survey Reports for Lot 3 and Lot 4 footbridges to be constructed under the project (MoPWT 2021a, b). We assume that the areas targeted by the first 19 footbridges are similar to those selected for the later lots (3 and 4). The baseline reports show that most of the project's target beneficiaries

[5] For clarity, the term 'affected' is used here in the sense of the definition of "direct project beneficiary" presented in the Project Appraisal Document (World Bank 2017), which states: "*direct project beneficiaries are people from communities with limited or seasonal access to key basic infrastructure, who will be provided with better access through the footbridges constructed under the project."* It is important to distinguish the definition of direct beneficiary present in the project's PAD from the concept direct jobs outcomes related to the projects impacts on the labor market.

reported walking between 30 and 60 minutes to access schools and health care services prior to the construction of the footbridges. Notwithstanding the reports do not provide information on the average distance to those basic services, it is possible to estimate them using the average travel time information available. Studies have shown that, on average, an individual walks at a speed of around 1.3 meters per second (Schimpl et al. 2011). This means that most of the individuals interviewed in the mentioned baseline reports walked a distance between 2.4 km and 4.7 km to access schools and health care facilities. Since most project beneficiaries walk less than 5 km without the footbridge, then a somewhat greater radius of 5 km to a planned bridge is a reasonable distance for delimiting the possible impact area.

Definition 2. ***Project Area:*** *Geographic area covered by the impact zones of the footbridges planned under the LTIC project.*

Definition 3. ***Benefitting Household:*** *A household interviewed in the CMS/HBS residing in the project area.*

In terms of labor market outcomes, a benefitting individual or household can be affected by the project via direct or indirect jobs impacts. Direct jobs impacts emerge from activities directly related to the project activities, such as the construction and the maintenance of the footbridges. However, indirect jobs effects are labor market impacts not directly attached to the project assets themselves. Those indirect job outcomes can be divided into three different categories as follows:

1) Forward factor usage: A change in the available supply, quality, or cost of an input, productive factor, or condition causes an impact on the labor market.
2) Backward supply chain: Jobs created as a result of changes in the demand for locally produced inputs by entities directly affected by the intervention and enterprises that use the good or service treated.
3) Consumption spillover effect: Job impacts resulting from changes in the demand for goods and services on the part of the people experiencing income changes from direct jobs, forward factor user jobs, and backward supply chain jobs impacts.

The main goal of this report is to estimate ex ante indirect job impacts for the individuals and households affected by the footbridges constructed under the LTIC project. In other words, estimating indirect jobs impacts for families living within a minimum 5 km distance from at least one footbridge planned in the project.

As of December 2021, the Implementation Status and Results Report (World Bank 2021a) informs that 41 footbridges are programmed to be constructed under the LTIC project and that 21 had been successfully constructed by that date. Therefore, the combined information provided by CMS/HBS and the ESMP document allows identifying families residing in impact zones of about half of the planned project footbridges (19 footbridges).

Definition 4. ***Households with footbridge access before project implementation:*** *Respondents to the CMS/HBS residing in the impact zone of at least one footbridge constructed before the LTIC project.*

4. Identifying benefitting individuals and households by the project

This section presents the methodology used to identify the individuals and households that responded to the CMS/HBS data and reside in impact zones of the footbridges constructed under the LTIC project.

4.1 Households and Project's Footbridges Locations

The key information used in the present methodology to identify project benefitting families in CMS/HBS is the distance between each household and the footbridges planned for construction under the project. As highlighted in the last section, footbridges are intended to benefit individuals who access markets and social services mainly by walking. Hence, the benefitting individuals must live in residences sufficiently close to the project's footbridges to have a higher probability of being a beneficiary. Therefore, following the argument, an essential step in identifying the project beneficiaries is to access the position of each household relative to the planned footbridge locations.

The geographic coordinates (latitudes and longitudes) provided by CMS/HBS and the ESMP documents will be the sources used to calculate the distance between each interviewed individual in the survey data and the initial planned project's footbridges. The CMS/HBS data provides the geographic position of each household interviewed in the data collection process, while the ESMP document presents precise coordinates of the project's initial 19 footbridges (Appendix II Table 9).

4.2 Benefitting Households

After collecting and merging the datasets discussed in the last subsection, the distance between each household interviewed in the survey and the 19 footbridges presented in the ESMP document is calculated. The next step is to identify the benefitting families, respecting the definitions presented in section 3.

Table 1. Number of Identified Benefitting Households and Individuals by Project's Footbridge in CMS/HBS

Footbridge	Benefitting Households	Benefitting Individuals*
Seroalankhoana - Mpokochela	8	1,985
Mpharane - Masokoaneng	0	0
Khetši - Matšosa	5	863
Kolberg - Matsoetsoe	0	0
Noha - Auplaas	0	0
Lulang - Tiping	12	4,995
Kokoana - Montmarter	12	4,022
Koebung - Peterose	0	0
Tsoelike - Thaba-Bosiu	0	0
Tšoeneng - Leralleng	12	3,464
Tšilo - Morumotšo	0	0

Footbridge	Benefitting Households	Benefitting Individuals*
Mekateng - Leutsoa	2	2,853
Bosco - Makhaola	15	9,546
Tuke-Mokomahatsi	25	10,539
Khasane - Thaba-Lesoba	1	258
Hlotse - Likhakeng	71	37,398
Seetsa - Fobane	24	13,878
Tšekelo - Mofeli	12	4,131
Mosamo - Mothamahane	2	974
Total	**201**	**94906**

Note: * - Number of benefitting individuals calculated considering sampling weights.

Table 1 presents the number of households and individuals who lived in the project area and were interviewed in the survey. For six footbridges, no households living within a radius of 5 km of any project planned footbridge were identified in the CMS/HBS data.

It is important to highlight that there is a difference between the projected number of benefitting individuals identified using the CMS/HBS data and the actual number of beneficiaries. The methodological approach followed in this report identifies benefitting individuals by approximation, and two important remarks must be noted. First, the CMS/HBS sampling process must not have reached all benefited villages. Hence, for some footbridges, no benefitting household was interviewed, and, for the remaining, the survey is expected to cover only part of the benefitting individuals. Second, selecting households living within a radius of 5 km around the footbridges and with no other restriction leads to considering households that are not actually affected by the new footbridges, inflating the number of identified beneficiaries. Despite those limitations, since the methodology proposed is selecting households within the project area, it is expected that the identified beneficiaries in CMS/HBS live under similar social conditions and share similar characteristics with the actually benefited individuals by the project, which allows projecting outcome results with confidence.

Finally, Table 2 exhibits the regions where the identified interviewed benefitting households are located. This information will be used in Section 6 to restrict the outcome estimates to the impact zones of the project's footbridges.

Table 2 – Number of Identified Benefitting Households by Region

Region	Benefitting Households	%
Rural Lowlands	75	37.9
Rural Mountains	37	18.7
Rural Foothills	15	7.6
Urban Areas excluding Maseru Region	71	35.9
Total	**198**	**100**

5. Identifying individuals and households with footbridges access before the project implementation

To assess the ex ante impacts of the project, it is necessary to anticipate the effects of the access to the project's footbridges on the intended outcomes and compare these estimates with the counterfactual scenario without the project.

The strategy proposed in this methodology to evaluate those impacts is to analyze how the access to existing footbridges is associated with the project's intended outcomes in the project area (Table 2), using the socioeconomic data available in CMS/HBS. The main goal of this exercise is to estimate differences in the intended program outcomes for households with and without access to existing footbridges, before the project's implementation, by controlling for observed characteristics and focusing on groups of households with a higher probability to be benefited from the access to the project's footbridges. Then, these estimates are applied to the baseline information of the benefitting households identified in section 3 to predict the project's impacts. The following equation summarizes the strategy:

$$\hat{y}^z = \left[1 + \frac{\hat{y}^z_{FB} - \hat{y}^z_{NFB}}{\hat{y}^z_{NFB}}\right] \bar{y}^z_{PA},$$

where $\hat{y}^z$ is the estimated ex ante effect of the footbridges on the outcome *z*, $\hat{y}^z_{FB}$ and $\hat{y}^z_{NFB}$ are, respectively, the outcome estimates for individuals and households with and without access to footbridges before the project's implementation, and $\bar{y}^z_{PA}$ is the baseline average of the outcome *z* in the project area.[6]

Following the argument, the estimated differences in outcomes for households with and without access to footbridges before the project can be interpreted as the anticipated impacts expected from the project. The baseline values of these outcomes for the identified benefitting households can be construed as the counterfactual scenario where the project does not take place.

Restricting this analysis to the target program regions identified in section 4 enhances the precision of the estimated impacts that can be expected from the program because it is likely that individuals living in those areas face similar social conditions and infrastructure restrictions to the project's target population.

Naturally, it is important to highlight that the conclusions achieved through the proposed methodology face limitations. First, the estimated impacts are based on correlations, and one must not derive causal interpretations. Second, the results can suffer from biases due to possible simultaneity, omitted variables, or other sources of bias. The most significant source of bias faced by the econometric analyses is that the existing footbridge locations are not random. It is likely that the existing footbridges were constructed near the country's most economically developed areas. Therefore, an econometric model that does not take this factor in account would omit important variables correlated with the government's decision on the footbridge locations, leading to endogeneity and simultaneity biases. Under this scenario, the estimated jobs impacts would be overestimated.

As detailed in section 6, to minimize the possibility of simultaneity/endogeneity, the regressions include an exhaustive control set of observable characteristics on the individual, household, and geographic levels in the estimates. Specially to overcome the bias arising from the footbridge's locations, the regressions will include a variable to control the distance of each family to the closest district's capital. The intention in using this variable is that the estimates consider the

[6] For binary outcomes, the estimated ex ante effect is the sum: $\hat{y}^z = \bar{y}^z_{PA} + (\hat{y}^z_{FB} - \hat{y}^z_{NFB})$.

proximity to developed economic centers, likely associated with the existing footbridge's locations, and, consequently, that the estimated jobs outcomes are separated from the location effect (bias). Hence, even considering the parameters estimated carefully, controlling for those factors permits considering the estimates as a reasonable direction for the program's expected results.

5.1 Households with footbridge access before the project's implementation

Analogous to the proceeding used in section 4, the strategy in this section is to identify households with and without access to footbridges by calculating the distance of each family to each existing footbridge. Consistent with the definition presented in section 3, an individual is considered benefited by a footbridge if his/her residence is no greater than 5 km from an existing footbridge, when interviewed in the CMS/HBS.

However, different from section 4, where the ESMP document provided precise information on the project's 19 footbridges' locations, the challenge faced in this analysis is to access the geographic position of each existing footbridge in the country at the time when the CMS/HBS occurred. Fortunately, notwithstanding the ESMP document does not provide precise coordinates regarding the existing footbridges, the report presents a detailed map showing roads, main towns, the initial planned 19 project footbridges' locations, and all the existing footbridges in the country for 2017 (Figure 7). This map, combined with the precise coordinates of the initial footbridges, permits georeferencing the existing footbridges in the country using the QGIS geographic information software. This spatial software allows combining these two pieces of information to extract the coordinates of each desired point in the map, including each existing footbridge represented.[7] The georeferenced footbridges are presented in Figure 8 (Appendix II).

Subsequent to this georeferencing process, exactly as in the previous section, the distances between the households and the existing footbridges are calculated. Then, it is possible to identify households and individuals interviewed in the CMS/HBS with access to at least one footbridge before the project implementation.

5.2 Subsamples

After identifying the households and individuals with and without access to at least one existing footbridge in 2017, before proceeding with the outcome estimates, some filters were made on the individuals surveyed in CMS/HBS. The restricted datasets (subsamples) intend to focus the analysis to the target areas identified in section 4 and to individuals with a higher probability of benefitting from a footbridge close to their households, following the project's rational for selecting the location of its footbridges.

[7] The combined information of the project's footbridges' coordinates, and their locations represented in the ESMP Map (Figure 7) allows QGIS to mirror this map on the Open Street Map Standard Map and georeferencing any point in the ESMP Map. Through this process, it is possible to extract from QGIS the coordinates (latitudes and longitudes) of each existent footbridge represented in the ESMP Map (Figure 8).

Subsample I - Restricted to Contemplated Regions

The subsample considers only individuals that live in the contemplated areas identified in section 4 (Table 2). Appendix I Figure 3 illustrates the restriction and presents the resultant number of individuals remaining in the dataset with and without access to at least one existing footbridge.

Subsample II - Restricted to Contemplated Regions, and Individuals who walk to school and live close to the school (<5 km)

The second subsample adds an additional layer to Subsample I by filtering individuals whose primary method used to access schools is by walking, and the distance between the school and the residence is up to 5 km. It is expected that individuals who access the attended schools by walking have a higher probability of benefitting from a new footbridge in the region and, therefore, are likely similar to the actually benefited individuals. Appendix I Figure 4 illustrates the filtering process.

Subsample III - Restricting to Contemplated Regions, and Individuals who visited health care centers within 5 km of the health facility

Analogous to Subsample II, the third dataset adds an additional layer to Subsample I. In addition to the benefited regions, the individuals are filtered considering how they access health care centers. Unfortunately, for this group of questions, the survey hadn't asked the interviewees whether they accessed those facilities by walking. To overcome this point, two filters are made: (a) individuals that had at least one appointment in the last four weeks and (b) individuals that reported that the health care center is up to 5 km from their residence. By doing these filters, the rationale is to select individuals with a higher probability of attending their appointment by walking and, therefore, being benefited by having access to a footbridge. Appendix I Figure 5 presents the resultant dataset.

Subsample IV - Restricting to Contemplated Regions, and Individuals on medication who walk to renew the medication

Finally, the fourth subsample filters individuals in the benefited regions that must use some medication on an ongoing basis. For this dataset, only individuals that periodically renew their medication by accessing medical facilities by walking are considered. Appendix I Figure 6 presents the resultant dataset. Table 3 presents a summary of the samples, showing the number of households with and without footbridge access before the project implementation in the contemplated regions.

Table 3 - Summary of Samples

Sample Number	Restrictions	Sample size (Households)	With Access to at least one footbridge	Without Access to a footbridge
0: Unrestricted	None	4,295	2,420	1,875
I: Region restriction	In project regions	3,176	1,802	1,374

Sample Number	Restrictions	Sample size (Households)	With Access to at least one footbridge	Without Access to a footbridge
II: Education access restriction	In project regions, individual walks to school and lives close to the school (< 5km)	1,715	1,039	676
III: Health access restriction I	In project regions, individual visited health care center within 5 km of the facility	845	473	372
IV: Health access restriction II	In project regions, individual is on medication and walks to renew medication	846	498	348

Important Remarks

Some considerations regarding these restricted datasets must be pointed out. First, each subsample here considered induces some bias in the analyses and will be suited to the estimates depending on the outcome studied. For example, Subsample I is highly represented by children (36 percent of the filtered individuals are under 15 years old), which can be a valid filter to estimate impacts on travel time reduction but not the most appropriated dataset to assess jobs impacts.

On the other hand, Subsamples III and IV, despite being more reliable in estimating impacts on jobs due to not considering children and focusing on individuals with a higher probability of being benefited by the footbridges, can present some bias in the estimates. For example, Subsample IV filters a specific group of workers that present medical conditions and, therefore, can influence the estimated labor impacts. Regarding Subsample III, since it is not possible to identify individuals that access the health care center by walking, most of the filtered individuals might not use a footbridge and induce some bias on the estimates. Finally, considering only Subsample I's results could lead to underestimating the project's impacts. This subsample restricted the analysis only to the contemplated project's regions, including all the individuals living in those regions with no additional constraints. Therefore, this cohort has a higher chance of being composed of a more significant share of individuals that would not benefit from the presence of a footbridge, unlike Subsamples II and III. Therefore, it is valuable to consider the results altogether and carefully analyze each estimate to assess the relevant results expected from the project.

6. Outcome Estimates

After identifying the CMS/HBS interviewed individuals that have access to at least one footbridge before the project's implementation and filtering the subsamples as explained in section 5, the next step is to estimate how having access to a footbridge is associated with different expected outcomes discussed in section 2.

Part of the outcomes studied are continuous variables, and part of them are binary/discrete variables. The regression models for continuous outcomes are estimated by ordinary least squares (OLS), and the regressions for the discrete outcomes are estimated by both OLS (linear probability

model) and the Probit model. Table 4 summarizes the outcomes and regression models considered to estimate the results.

Table 4 - Outcomes and Regression Models

Outcome	Variable Characteristic	OLS	Probit
Travel Time			
Time to get to school (Min)	Continuous	Yes	No
Time to get to health care center (Min)	Continuous	Yes	No
Employment			
Employed	Binary	Yes	Yes
Paid Employee	Binary	Yes	Yes
Employment on Agriculture Sector	Binary	Yes	Yes
Job Quality Conditions			
Written Contract	Binary	Yes	Yes
Employer Contribute to Pension Fund	Binary	Yes	Yes
Paid Vacation Leave	Binary	Yes	Yes
Paid Sick Leave	Binary	Yes	Yes
Maternity Leave	Binary	Yes	Yes
Medical Benefits	Binary	Yes	Yes
Permanent Job	Binary	Yes	Yes
Wage (Last Wage Payment)	Continuous	Yes	No
Poverty Status	Continuous	Yes	No
Consumption Per Capita	Continuous	Yes	No
Agricultural production planned for Sale	Binary	Yes	Yes
Occupations Level			
Level 1 Occupations	Binary	Yes	Yes
Level 2 Occupations	Binary	Yes	Yes
Level 3 and 4 Occupations	Binary	Yes	Yes

For each selected outcome, the following econometric model is estimated by OLS:

$$y_i = \alpha + \delta_i FB_i + \beta_i X_i + \varepsilon_i,$$

where y_i is the outcome of interest of the individual i, FB_i is a dummy variable indicating whether the individual has access to at least one footbridge before the program's implementation, α is constant, and X_i is a vector of control variables for observable characteristics on the individual, household, and geographic levels. Therefore, the parameter of interest in each of the following regressions is δ_i. Appendix IV presents a detailed list defining each outcome and control variable considered in the estimates.

On the geographic level, the subset of controls includes the distance of each household residence to the closest district capital. To build this control variable, the city coordinates presented in Table 5 are considered. As highlighted in section 5, this variable is expected to capture the region's characteristics correlated with the government's definition of the existing footbridges' locations. Therefore, it is a crucial control to minimize possible endogeneity biases arising from the no random location of the existing footbridges in Lesotho before the program.

For the binary outcome variables, besides the OLS model presented, the following Probit model is estimated:

$$\Pr(Y = 1|X) = \Phi\,(\alpha + \delta_i FB_i + \beta_i X_i),$$

where Φ is the cumulative distribution function of the standard normal distribution [8]. Under the Probit model, we are interested in the marginal effects of the variable FB_i. Since FB_i is a dummy variable, the marginal effect is given by $\Pr(Y = 1|FB = 1) - \Pr(Y = 1|FB = 0)$[9]. Appendix III A provides the main estimates outputs for all outcomes and econometric models.

Table 5 - District's capitals coordinates

District	Capital	Latitude	Longitude
Berea	Teyateyaneng	−29.15	27.7333
Butha-Buthe	Butha-Buthe	−28.7833	28.2333
Leribe	Hlotse	−28.8734	28.0416
Mafeteng	Mafeteng	−29.8231	27.2375
Maseru	Maseru	−29.31	27.48
Mohale's Hoek	Mohale's Hoek	−30.159	27.48
Mokhotlong	Mokhotlong	−29.2885	29.0656
Qacha's Nek	Qacha's Nek	−30.1153	28.6894
Quthing	Quthing	−30.4001	27.7002
Thaba-Tseka	Thaba-Tseka	−29.5333	28.6

Source: https://simplemaps.com/data/ls-cities

Appendix III B presents the results for the same regressions considered in Appendix III A, but restricts the estimates only to rural mountain areas. Although Table 2 identifies beneficiaries in rural foothills, rural lowlands, and some urban areas, the Project Appraisal Document (World Bank 2017) emphasizes the project's focus on rural mountain areas with limited or seasonal access to key basic infrastructure. Therefore, it is expected that the remaining footbridges that will be constructed under the program will mainly contemplate these regions. Hence, this additional exercise, focused on those areas, can provide a better understanding of the project's potential impacts.

Travel Time Reduction

The first estimates intend to evaluate the project's direct impact on the travel time needed to reach essential social services. The datasets consider in these estimates are Subsamples II and III. As explained in the last section, these cohorts filter groups of individuals with a higher probability of using a footbridge to access these social services. Appendix III A, Section A, summarizes the results. The estimates suggest that the presence of a footbridge reduces the travel time to access schools and health care centers by about 9 percent and 15 percent, respectively. Considering only rural mountain regions, no statistically significant time reduction is estimated to reach schools, but the time necessary to get to health care centers decreases considerably by around 40.3 percent (Appendix III B, Section A).

Employment

Appendix III A, Section B, presents the estimates for employment rate, the proportion of paid employees among the individuals employed, and the proportion of employment in the

[8] Let $\boldsymbol{\beta}$ denotes the parameters vector, the cumulative distribution is given by $\Phi(x, \boldsymbol{\beta}) = \int_{-\infty}^{x,\boldsymbol{\beta}} \frac{1}{\sqrt{2\pi}} e^{-x^2/2}\, dx$.

[9] For continuous independent variables, the marginal effects are given by $\hat{\beta}_i \phi(\alpha + \hat{\delta}_i FB_i + \hat{\beta}_i X_i)$.

agricultural sector. Subsample II is not considered to measure those effects since this dataset is highly represented by children. Considering all the benefited regions, no significant effect is estimated, even for the Subsamples III and IV, the most suitable cohorts to evaluate impacts on jobs.

When the analysis is restricted to rural mountain areas, the estimates for Subsamples I and III show a positive impact on the probability of an individual being employed in a remunerated job (Appendix III B, Section B). On average, the presence of a footbridge is associated with a 29 percent (43.7 percent considering the Probit estimate) higher chance of an employed individual being a paid employee for Subsample III and 8 percent for Subsample I. These results are in line with the project's theory of change discussed in section 2, suggesting that the presence of this transportation infrastructure increases the accessibility to job opportunities, reducing the number of self-employed individuals.

Jobs Quality

Focusing again on Subsamples III and IV, the estimated results for job quality characteristics suggest a positive association between the access to a footbridge and the probability of accessing jobs based on written contracts, with paid sick leave, paid vacation leave, maternity leave, and employer's contribution to retirement plans. Moreover, the results indicate an 8.2 percent (9.3 percent for Probit model) higher chance of being employed in a permanent position (Appendix III A, Section C). Positive impacts on permanent jobs with retirement plans and paid sick leave are also estimated for Subsample I. It is interesting to note that, for those subsamples, despite the estimates indicating positive impacts on the job conditions, the results do not show a higher chance of being employed in a paid position, as commented in the previous subsection. Combined, these results suggest that access to footbridges enhance workers' probability of accessing and moving to better quality jobs but do not impact the unemployment rate.

Similar results on jobs quality are verified considering only rural mountain areas. Considering Subsample III's cohort, there is a 26.6 percent higher chance of the population with access to a footbridge having access to jobs with formal contracts, a 14.6 percent higher probability of having the right to maternity leave, and a 10.2 percent higher chance of being in permanent work position (Appendix III B, Section C).

Poverty, Consumption, and Wages

Consistent with the presented results, the estimates indicate a positive impact on consumption per capita and poverty reduction. These results are likely connected to the higher access to remunerated positions and better job conditions, as shown above. Considering all benefited regions, the chance of an individual declaring being poor is estimated between 2 percent and 8.5 percent lower for those with access to at least a footbridge (Appendix III A, Section E), and the average consumption per capita is between 3.7 percent and 8.8 percent greater (Appendix III A, Section E). Regarding wages, the estimates did not capture statistically significant impacts. These estimates suggest that even though footbridges are associated with a higher chance to access

paid jobs, the remuneration of those jobs is in line with the paid positions of similar regions without access to footbridges.

Similar results are estimated for rural mountain regions, with a reduction between 10 percent and 18.5 percent in the proportion of individuals who declared themselves poor and an increase between 20 percent and 24.4 percent in consumption per capita. Again, no significant results are estimated for wages (Appendix III B, Sections D, E, and F).

Occupation Skill Levels

Although the estimated results indicate a positive association between footbridges and better job conditions, the results do not show changes in the distribution of the occupation skill levels of the work positions. The data analyzed here do not support the hypothesis that access to footbridges leads to a higher probability of being employed in high-skill positions, as shown in sections H of Appendix III A and Appendix III B.

A more informative analysis would assess the long-term impact of accessing those infrastructures and the labor market skills distribution. As the footbridges facilitate access to schools and other essential social services, it is expected to have a positive impact on workers' qualifications, especially in the long term. Unfortunately, the data considered in the estimates only allows for identifying footbridges' locations but not for how long the benefited population has access to them. Therefore, it does not permit evaluating the results from a long-term perspective.

Agricultural production destined for sale

On the regressions run to assess employment impacts, no statistically significant result is observed regarding the proportion of workers employed in the agricultural sector. Nevertheless, the data show a significant association between the presence of a footbridge and the proportion of the agricultural production planned for sale on the market. As discussed in the project's theory of change, the footbridges are expected to increase market connectivity, helping to expand and develop agricultural production. Considering all benefited regions, the estimate for Subsample IV indicates that areas with access to footbridges destinate 12.8 percent more of their agricultural production for sale than those without access (Appendix III A, Section G).

For rural mountain regions, different results are estimated. Considering Subsample IV, the estimated proportion destinated to sale is 17.8 percent higher in areas with access to footbridges, but this difference is not statistically significant. For Subsample I, the estimates indicate a reduction in the production destinated for sale (Appendix III B, Section G). As commented in section 2, two concurrent movements affect this outcome. On the one hand, the demand expansion incentivizes the production orientated to the market. On the other hand, the footbridges reduce transport costs and natural competition barriers that protect local producers from the competition of outside suppliers. Considering all benefited regions, the first effect seems stronger than the second. However, analyzing the rural mountain areas separated, the competition effects are more significant, reducing the local production destined for sales.

7. Ex Ante Estimated Results on Benefitting Individuals

This section presents the estimated ex ante impacts for the project's benefitting individuals identified through the methodology presented in section 4. The results are calculated based on the statistically significant estimates obtained in the last section. Table 6 and Table 7 summarize the results projections for all benefited regions and only for rural mountain regions, respectively. For each outcome, the results estimated in section 6 are applied over the baseline values. Therefore, consistently with those estimated results and the project's theory of change, the primary ex ante impacts expected are the reduction in the travel time needed to access essential social services, higher access to jobs with better contractual conditions, and a higher probability of being in a paid position. In addition, as a direct result of the access to higher quality remunerated jobs, the estimates also anticipated a significant poverty reduction and an increase in consumption per capita. Finally, the project is expected to induce farms to destinate a higher ratio of agricultural production to sales when all benefited regions are considered. Following the project's theory of change, these results are linked to the increased market connectivity granted through the project.

Although there are few papers in the literature evaluating the impacts of footbridges on social and economic indicators, the ex ante results estimated for the LTIC project are connected with the related main papers on this subject. For instance, Brooks and Donovan (2020) estimate that floods decrease labor market income by 18 percent in areas with no access to bridges linking rural villages to markets in Nicaragua. Even though the results estimated for Lesotho do not support an increase in jobs remuneration, analyzing the mountain areas, the regions more susceptible to similar climate conditions, we can observe that the estimates indicate an increase of around 29 percent in the proportion of workers allocated in paid jobs for individuals with access to footbridges (Table 7). Other results linked to Brooks and Donovan (2020) are the higher levels of per capita consumption and poverty alleviation in areas with access to footbridges.

Thomas et al. (2021) likewise present results directly connected to the lower levels of poverty, higher level of per capita consumption, and a higher chance of being employed in a remunerated position, estimated for rural mountains. The authors studied the impact of the construction of rural trail bridges in Rwanda. They estimated a 25 percent increase in the labor market earnings over the baseline for sites with access to them, with 48 percent earnings increase inside villages and 21 percent outside.

Table 6 – Statistically Significant Ex Ante Estimated Effects for Identified Benefitting Individuals

	Baseline			Project's Estimated Effects		
Outcomes (All Benefited Regions)	**Subsample II**	**Subsample III**	**Subsample IV**	**Subsample II**	**Subsample III**	**Subsample IV**
Travel Time						
Time to get to school (Minutes)	20.8	-	-	18.9	-	-
Time to get to health care center (Minutes)	-	16.8	-	-	14.2	-
*Jobs Quality**						
Written Contract	-	-	21.7%	-	-	29.0%
Employer Contribute to Pension Fund	-	-	17.4%	-	-	20.6%
Paid Sick Leave	-	-	15.9%	-	-	23.5%
Permanent Job	-	-	21.1%	-	-	29.3%
*Poverty Status**						
Proportion of poor individuals	-	42.3%	-	-	49.4%	-
Consumption Level						
Consumption Per Capita (Maloti)	-	944.5	-	-	1027.82	-
*Agricultural Production**						
Proportion planned to sale	-	-	20.8%	-	-	36.0%

*Notes: *Calculations based on OLS Estimates.*

Table 7 - Statistically Significant Ex Ante Estimated Effects for Identified Benefitting Individuals in Rural Mountain Areas

	Baseline		Project's Estimated Effects	
Outcomes (Rural Mountains Regions)	**Subsample I**	**Subsample III**	**Subsample I**	**Subsample III**
Travel Time				
Time to get to health care center (Minutes)	-	18.6	-	11.1
*Employment**				
Paid Employee	-	50.7%	-	79.7%
*Jobs Quality**				
Written Contract	-	0.0%	-	25.8%
Paid Sick Leave	-	12.6%	-	26.6%
Paid Vacation Leave	-	0.0%	-	9.2%
Maternity Leave	-	0.0%	-	13.9%
Permanent Job	-	0.0%	-	10.1%
*Poverty Status**				
Proportion of poor individuals	-	67.0%	-	53.8%
Consumption Level				
Consumption Per Capita (Maloti)	-	460.0	-	572.28
*Agricultural Production**				
Proportion planned to sale	50.0%	-	39.4%	-

*Notes: *Calculations based on OLS Estimates.*

Regarding agricultural production, when all benefited regions are considered, the results presented by Thomas et al. (2021) are also consistent with the ex ante estimates for Lesotho. The authors estimated a 55 percent increase in the share of harvest taken to markets for sale but did not observe a significant change in the agricultural outputs or inputs. For Lesotho, the estimates indicate a 15.2 percent increase in the production ratio destined for sales but do not support an increase in agricultural sector employment (Table 6). The data considered in Lesotho's estimates do not permit assessing the program's impact on the agricultural production level but only on the production destination (share destinated for sale) and the employment level in the sector. Therefore, it is not possible to conclude that the estimated no impact on employment implies no effect on the production level, as observed in Thomas et al. (2021). Besides, as highlighted in

section 6 for the employment estimates, the analysis presented in this report can be limited to the time horizon considered. Since the available data do not permit evaluating how long the individuals studied have access to footbridges, the analyses might not be able to capture long-term impacts on the agricultural sector.

An additional perspective on the results is presented in Table 8. Considering the number of beneficiaries identified in the PAD, Table 8 translates the employment estimates presented in Table 6 and 7 in terms of number of employees. The PAD estimated 26,200 benefitting individuals for all planned bridges considered here. It is possible to estimate the baseline number of individuals in each outcome category considered in the estimates using the information available in the CMS/HBS. For instance, when all regions are considered, the employment rate in areas without access to footbridges is around 79 percent, and the proportion of employed individuals under formal contracts is about 22 percent (Subsample IV). Combining this information allows calculating a baseline number of 4,494 individuals employed under a written contract. Then, by projecting the Table 6 estimates, it is expected that 5,771 individuals will be under formal agreements after the project. This implies that 1,511 individuals are benefited from the project under this outcome. Table 8 exhibits the same calculations for the remaining employment outcomes presented in Table 6 and 7 and results for rural mountain areas.

Table 8 - Project's Estimated Effects on Employment considering PAD's Benefitting Individuals

	Baseline	Project's Estimated Effects
Outcomes (All Regions*)	**Subsample IV**	**Subsample IV**
Jobs Quality		
Written Contract	4494	6005
Employer Contribute to Pension Fund	3599	4261
Paid Sick Leave	3285	4858
Permanent Job	4367	6064

	Baseline	Project's Estimated Effects
Outcomes (Rural Mountains Regions)**	**Subsample III**	**Subsample III**
Employment		
Paid Employee	3991	6273
Jobs Quality		
Written Contract	0	2030
Paid Sick Leave	995	2096
Paid Vacation Leave	0	721
Maternity Leave	0	1094
Permanent Job	0	795

*Notes: *26200 Benefitting Individuals (Project Appraisal Document, World Bank 2017)*

***9750 Benefitting Individuals in Mountains Areas (Project Appraisal Document, World Bank 2017)*

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Appendix I – Subsamples

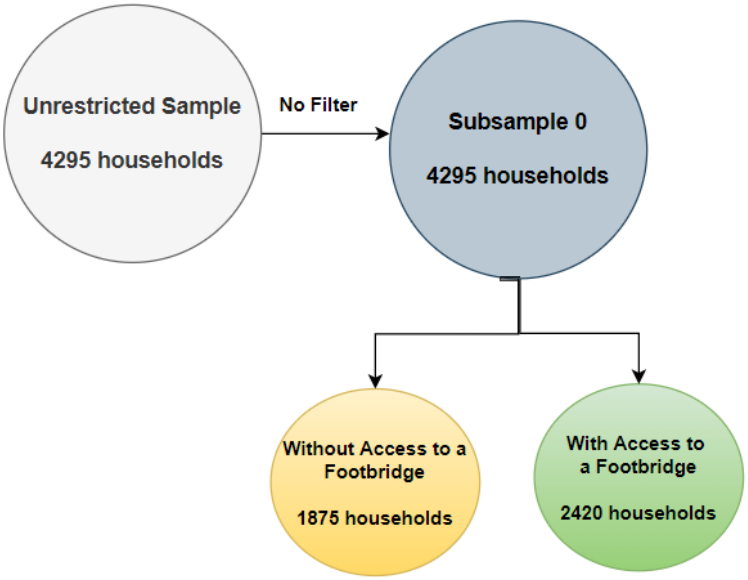

Figure 2 – Unrestricted Sample

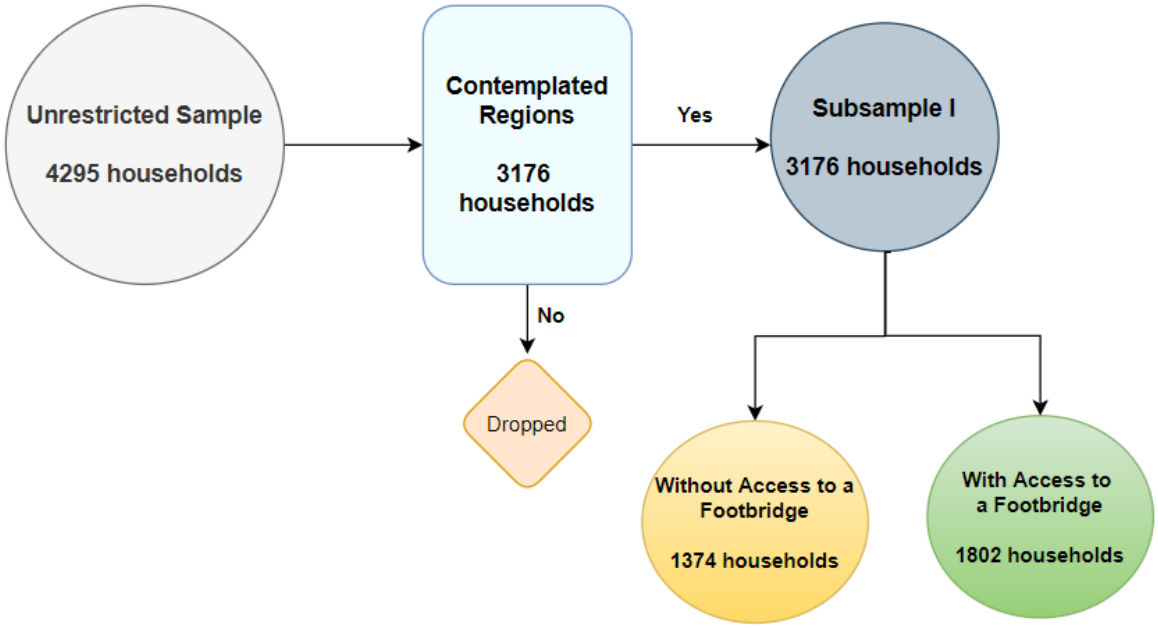

Figure 3 - Subsample I: Restricted to Contemplated Regions (Rural Lowlands, Rural Foothills, Rural Mountains, and Urban Areas excluding the Maseru region).

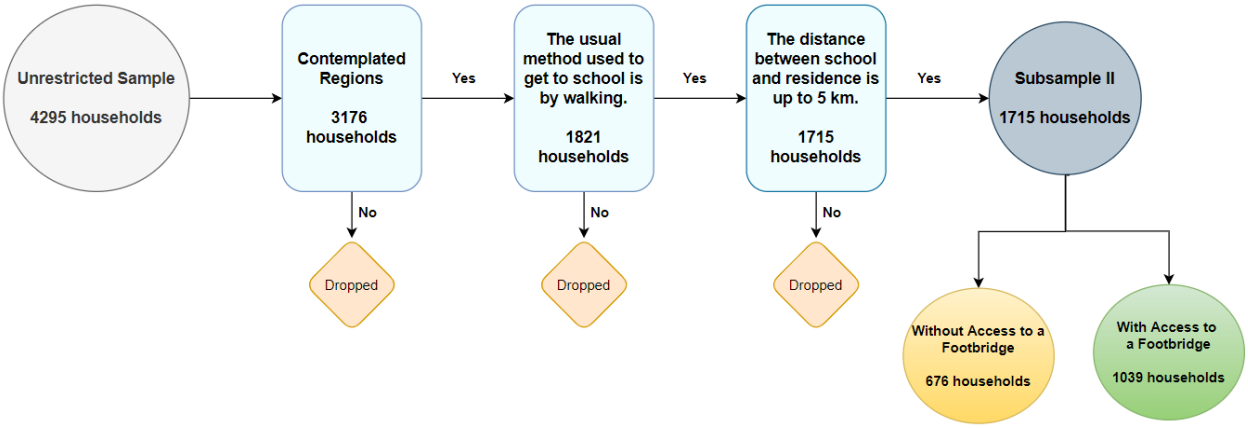

Figure 4 - Subsample II: Restricted to Contemplated Regions, and Individuals who walk to school and live close to the school (< 5km).

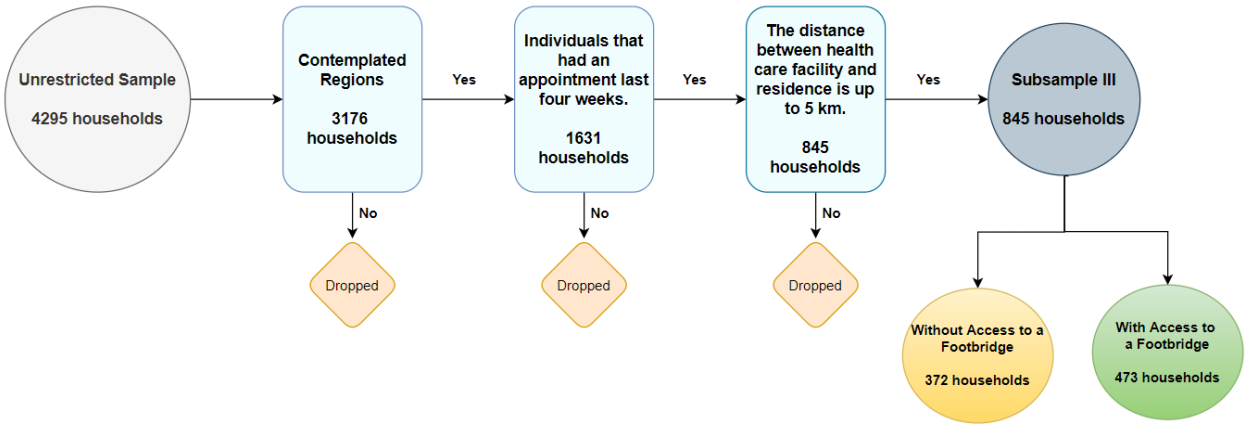

Figure 5 - Subsample III: Restricted to Contemplated Regions, and Individuals who visited health care centers within 5 km of the health facility.

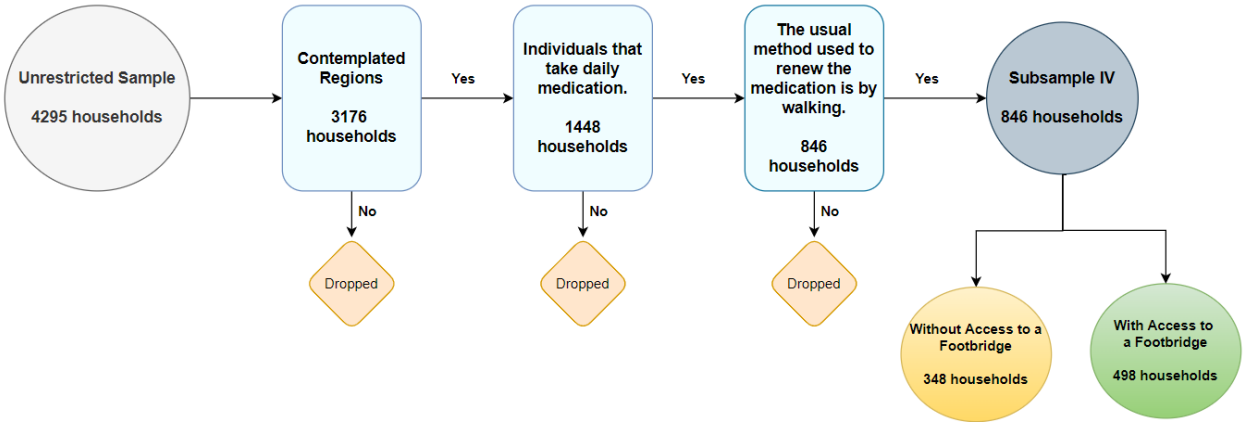

Figure 6 - Subsample IV: Restricted to Contemplated Regions, and Individuals on medication who walk to renew the medication.

Appendix II - Footbridges Georeferenced

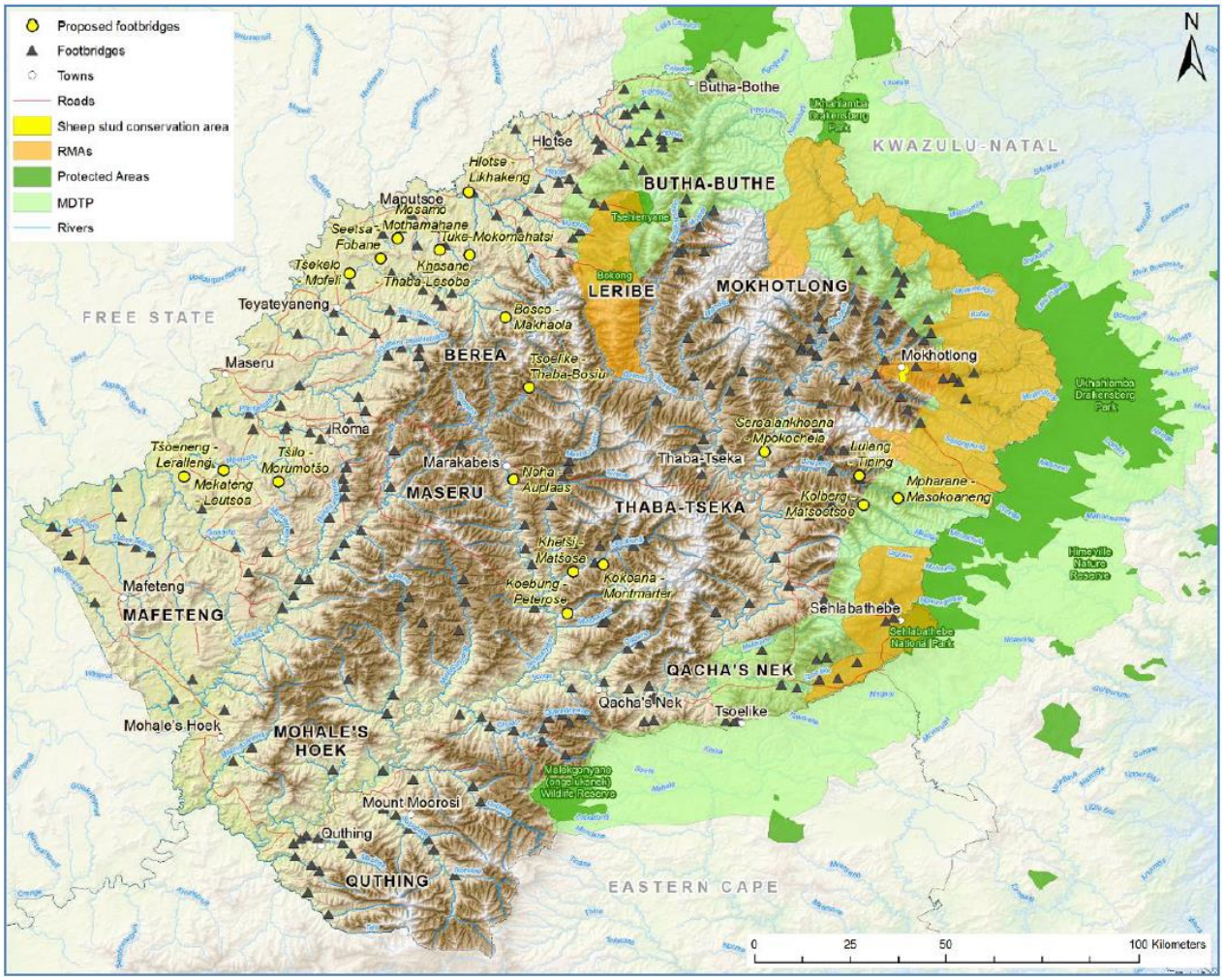

Figure 7 - Map of roads, existing footbridges, and the program's planned footbridges.

Source: Ministry of Public Works and Transport of Lesotho (2017).

District	Name of Footbridge	RD Code	River Crossing	Ecological Zone	Degrees South	Degrees South
Thaba-Tseka	Seroalankhoana - Mpokochela	TT/FB/27	Senqu	Mountains	29°29'22"	28°45'24"
	Mpharane - Masokoaneng	TT/FB/39	Linakeng	Mountains	29°35'52"	29°04'11"
	Khetši - Matšosa	TT/FB/41	Lesobeng	Mountains	29°46'10"	28°18'29"
	Kolberg - Matsoetsoe	TT/FB/42	Mashai	Mountains	29°36'48"	28°59'22"
	Noha - Auplaas	TT/FB/44	Nkhoaneng	Mountains	29°33'16"	28°10'04"
	Lulang - Tiping	TT/FB/46	Manamaneng	Mountains	29°32'43"	28°58'45"
	Kokoana - Montmarter	TT/FB/47	Likotopong	Mountains	29°45'11"	28°22'40"
	Koebung - Peterose	TT/FB/49	Koebung	Mountains	29°52'05"	28°17'39"
	Tsoelike - Thaba-Bosiu	TT/FB/53	Senqunyane	Mountains	29°20'20"	28°12'16"
Maseru	Tšoeneng - Leralleng	MS/FB/31	Sebolu	Lowlands	29°32'52"	27°23'40"
	Tšilo - Morumotšo	MS/FB/33	Mampentsi	Foothills	29°33′32″	29°36′57″
	Mekateng - Leutsoa	MS/FB/50	Mafemekoane	Lowlands	29°31'58"	27°29'13"
Berea	Bosco - Makhaola	BR/FB/45	Liotloaneng	Foothills	29°10'21"	28°08'55"
	Tuke-Mokomahatsi	BR/FB/46	Mokomahatsi	Lowlands	29°01'00"	27059'39"
	Khasane - Thaba-Lesoba	BR/FB/47	Khasane	Foothills	29°01′40″	28°03′54″-
Leribe	Hlotse - Likhakeng	LE/FB/23	Hlotse	Lowlands	28°52'50"	28°03'45"
	Seetsa - Fobane	LE/FB/36	Linyane	Lowlands	29°02'09"	27°51'21"
	Tšekelo - Mofeli	LE/FB/55	Phuthiatsana	Lowlands	29°04'19"	27°46'57"
	Mosamo - Mothamahane	LE/FB/56	Maqhu	Lowlands	28°59'22"	27°53'45"

Table 9 - Coordinates of 19 planned footbridges under the program.

Source: Ministry of Public Works and Transport of Lesotho (2017).

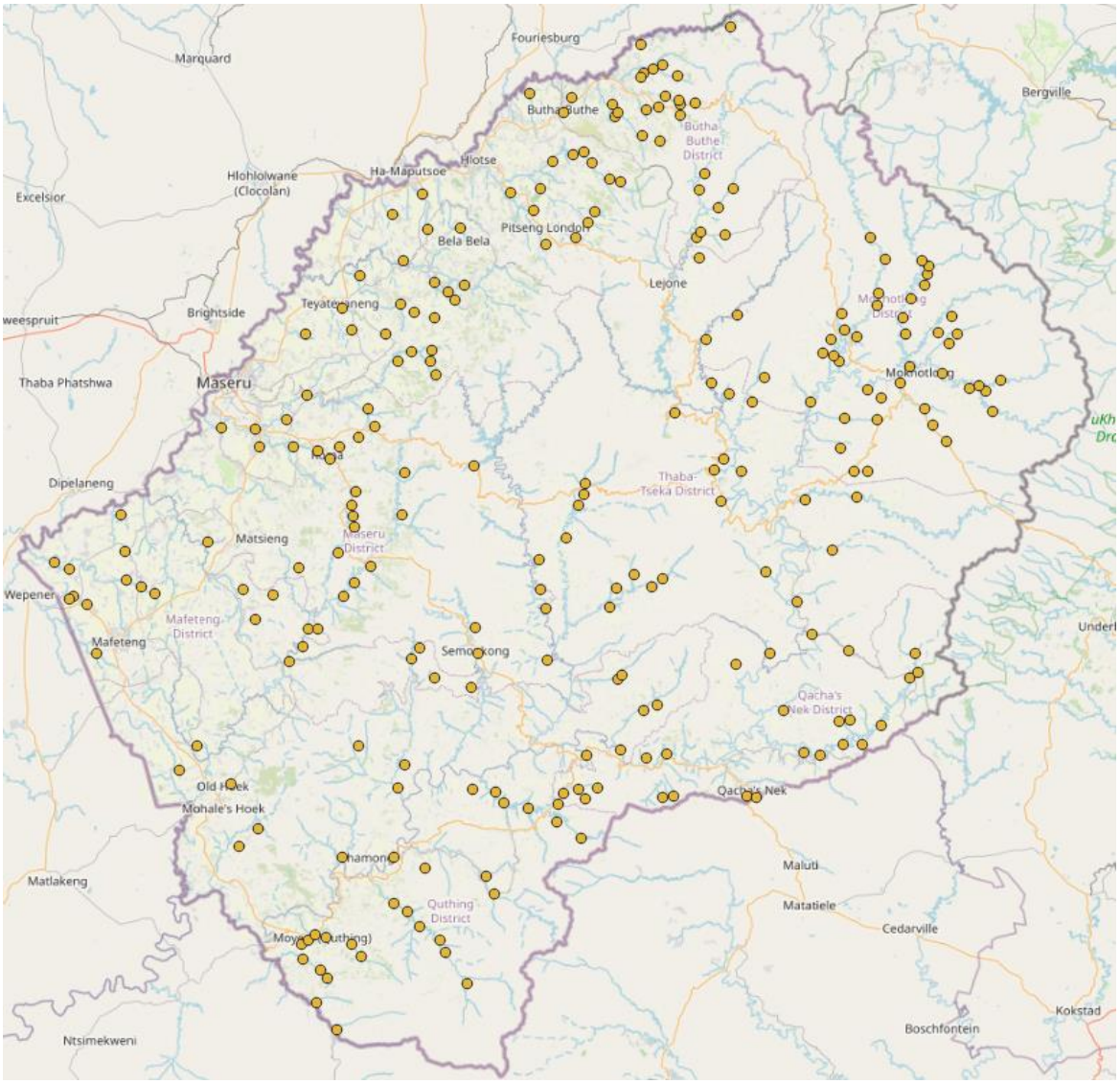

Figure 8 - 252 existing footbridges georeferenced using Figure 7 Map and the planned footbridges coordinates (Table 9).

Source: Author, using QGIS software.

Appendix III A - Outcome Estimates

A) Travel Time

	Subsample II	**Subsample III**
	Time to get to school (Minutes)	Time to get to health care center (Minutes)
Access to a Footbridge	−2.454**	−2.963***
	(1.151)	(0.993)
Controls		
Individual	Yes	Yes
Education	No	No
Household	Yes	Yes
Geographic	Yes	Yes
Observations	1,253	959
Without Footbridge (Mean)	27.34	19.66
R-squared	0.073	0.078

Note: Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

B) Employment

	Subsample 0					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.013	−0.072	0.003	0.009	0.011	0.079
	(0.011)	(0.049)	(0.015)	(0.046)	(0.012)	(0.051)
Marginal Effects[(a)]		−0.015		0.003		0.018
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,305	5,285	4,427	4,417	4,462	4,462
R-squared	0.085		0.077		0.231	

	Subsample I					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.017	−0.091*	0.026	0.085	0.001	0.007
	(0.013)	(0.055)	(0.017)	(0.053)	(0.015)	(0.058)
Marginal Effects[(a)]		−0.020*		0.029		0.002
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,878	3,872	3,182	3,169	3,208	3,204
R-squared	0.100		0.091		0.207	

	Subsample III					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.012	−0.008	0.002	0.021	−0.015	−0.074
	(0.035)	(0.187)	(0.055)	(0.165)	(0.040)	(0.194)
Marginal Effects[(a)]		−0.001		0.007		−0.017
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	432	423	370	363	372	307
R-squared	0.161		0.165		0.178	

	Subsample IV					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.020	0.052	0.045	0.128	0.036	0.168
	(0.035)	(0.176)	(0.056)	(0.149)	(0.045)	(0.169)
Marginal Effects[(a)]		0.009		0.049		0.049
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	495	466	424	416	430	397
R-squared	0.126		0.128		0.192	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

C) Jobs Quality Conditions

Subsample 0

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.007	−0.011	0.012	0.105*	0.003	0.058	0.003	0.050	0.004	0.044	−0.012*	−0.124*	0.014	0.073*
	(0.012)	(0.045)	(0.009)	(0.061)	(0.007)	(0.066)	(0.010)	(0.051)	(0.015)	(0.084)	(0.006)	(0.073)	(0.012)	(0.044)
Marginal Effects[(a)]		−0.003		0.012*		0.005		0.010		0.008		−0.007*		0.022*
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,795	5,784	5,775	5,742	5,792	5,783	5,793	5,793	2,390	2,268	5,775	5,753	5,795	5,771
R-squared	0.251		0.247		0.131		0.225		0.304		0.065		0.172	

Subsample I

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.018	0.076	0.017*	0.160**	-0.004	0.014	0.021**	0.151**	0.014	0.134	-0.014**	-0.154*	0.042***	0.180***
	(0.013)	(0.053)	(0.009)	(0.072)	(0.007)	(0.078)	(0.010)	(0.061)	(0.015)	(0.104)	(0.007)	(0.086)	(0.013)	(0.052)
Marginal Effects[(a)]		0.021		0.015**		0.001		0.025**		0.017		-0.008*		0.049***
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,274	4,268	4,261	4,258	4,272	4,269	4,273	4,270	1,727	1,658	4,259	4,243	4,274	4,271
R-squared	0.238		0.246		0.135		0.222		0.345		0.062		0.151	

Subsample III

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.011	−0.062	−0.003	−0.153	0.006	−0.022	0.036	0.148	0.046	0.285	−0.016	−0.289	0.022	0.074
	(0.042)	(0.158)	(0.027)	(0.195)	(0.023)	(0.204)	(0.035)	(0.167)	(0.034)	(0.250)	(0.018)	(0.267)	(0.044)	(0.160)
Marginal Effects[(a)]		−0.019		−0.019		−0.001		0.031		0.028		−0.007		0.023
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	453	449	452	416	453	417	453	449	265	254	449	358	453	444
R-squared	0.268		0.323		0.231		0.240		0.452		0.117		0.231	

Subsample IV

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.073**	0.383**	0.032*	0.486**	0.023	0.780***	0.076***	0.623***	0.040	0.684**	-0.001	0.181	0.082**	0.442***
	(0.032)	(0.149)	(0.019)	(0.239)	(0.014)	(0.294)	(0.026)	(0.190)	(0.028)	(0.272)	(0.013)	(0.330)	(0.033)	(0.167)
Marginal Effects[(a)]		0.086**		0.025**		0.017**		0.077***		0.036*		0.005		0.093***
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	545	539	545	487	545	477	545	539	328	314	542	245	545	539
R-squared	0.188		0.147		0.167		0.130		0.260		0.119		0.191	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

D) Wages

	Subsample 0	**Subsample I**	**Subsample III**	**Subsample IV**
	Last Wage Payment	Last Wage Payment	Last Wage Payment	Last Wage Payment
Access to a Footbridge	−187.4	−351.3**	−592.0	45.27
	(119.0)	(139.9)	(395.6)	(239.9)
Controls				
Individual	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes
Observations	3,173	2,225	255	276
Without Footbridge (Mean)	3112.6	3050.7	3028.5	1713.5
R-squared	0.442	0.394	0.497	0.473

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

E) Poverty Status

	Subsample 0		**Subsample I**		**Subsample II**		**Subsample III**		**Subsample IV**	
	Poverty Status		Poverty Status		Poverty Status		Poverty Status		Poverty Status	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.018**	−0.054*	−0.024**	−0.065**	−0.011	−0.038	−0.071**	−0.212**	−0.031	−0.097
	(0.009)	(0.028)	(0.010)	(0.032)	(0.028)	(0.089)	(0.032)	(0.101)	(0.032)	(0.093)
Marginal Effects[(a)]		−0.021*		−0.026**		−0.014		−0.085**		−0.038
Controls										
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,684	11,659	8,802	8,793	1,212	1,196	928	905	1,006	988
R-squared	0.246		0.215		0.237		0.259		0.172	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

F) Consumption

	Subsample 0	**Subsample I**	**Subsample II**	**Subsample III**	**Subsample IV**
	Consumption Per Capita	Consumption Per Capita	Consumption Per Capita	Consumption Per Capita	Consumption Per Capita
Access to a Footbridge	16.63	25.99*	10.45	61.64*	38.11
	(12.54)	(13.68)	(22.51)	(37.13)	(32.40)
Controls					
Individual	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes
Observations	11,684	8,802	1,212	928	1,006
Without Footbridge (Mean)	771.58	703.71	561.8	698.7	600.72
R-squared	0.407	0.368	0.472	0.430	0.324

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

G) Agricultural Production for Sale

	Subsample 0		**Subsample I**		**Subsample III**		**Subsample IV**	
	Agricultural production planned for Sale		Agricultural production planned for Sale		Agricultural production planned for Sale		Agricultural production planned for Sale	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.005	0.025	0.000	0.002	−0.014	−0.103	0.152**	0.621**
	(0.022)	(0.073)	(0.025)	(0.081)	(0.091)	(0.354)	(0.069)	(0.252)
Marginal Effects[(a)]		0.008		0.001		−0.023		0.128**
Controls								
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,886	1,883	1,492	1,476	122	113	190	184
R-squared	0.044		0.047		0.315		0.244	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

H) Occupations Level

	Subsample 0					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.017	0.058	−0.020	−0.058	−0.001	0.013
	(0.014)	(0.047)	(0.016)	(0.044)	(0.004)	(0.060)
Marginal Effects[(a)]		0.020		−0.023		0.000
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,442	4,431	4,442	4,442	11,666	11,636
R-squared	0.190		0.126		0.272	

	Subsample I					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.012	0.054	-0.012	-0.035	-0.004	-0.029
	(0.017)	(0.055)	(0.018)	(0.051)	(0.004)	(0.070)
Marginal Effects[(a)]		0.019		-0.014		-0.001
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,205	3,199	3,205	3,199	8,800	8,775
R-squared	0.198		0.128		0.255	

	Subsample III					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.050	0.218	−0.026	−0.077	−0.004	−0.204
	(0.050)	(0.172)	(0.054)	(0.160)	(0.013)	(0.197)
Marginal Effects[(a)]		0.076		−0.030		−0.004
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	372	341	372	369	928	835
R-squared	0.264		0.236		0.343	

	Subsample IV					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.016	0.073	0.013	0.029	−0.009	−0.305
	(0.050)	(0.156)	(0.052)	(0.154)	(0.011)	(0.231)
Marginal Effects[(a)]		0.027		0.012		−0.006
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	430	405	430	417	1,006	875
R-squared	0.243		0.234		0.216	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

Appendix III B – Outcome Estimates (Rural Mountain Areas)

A) Travel Time

	Subsample II	**Subsample III**
	Time to get to school (Minutes)	Time to get to health care center (Minutes)
Access to a Footbridge	−2.423	−9.199***
	(3.058)	(2.232)
Controls		
Individual	Yes	Yes
Education	No	No
Household	Yes	Yes
Geographic	Yes	Yes
Observations	364	233
Without Footbridge (Mean)	34.72	22.84
R-squared	0.061	0.201

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

B) Employment

	Subsample I					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.017	0.034	0.080**	0.226**	−0.031	−0.086
	(0.029)	(0.121)	(0.040)	(0.112)	(0.036)	(0.115)
Marginal Effects[(a)]		0.008		0.084**		−0.034
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,032	970	862	839	864	848
R-squared	0.084		0.115		0.273	

	Subsample III					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.035	0.803	0.290*	1.140***	0.020	−0.022
	(0.087)	(0.782)	(0.151)	(0.437)	(0.143)	(0.427)
Marginal Effects[(a)]		0.127		0.437**		−0.007
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	101	59	83	71	83	67
R-squared	0.441		0.385		0.346	

	Subsample IV					
	Employed		Paid Employee		Employment on Agriculture Sector	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.113	−0.590	0.084	0.231	−0.004	0.035
	(0.071)	(0.375)	(0.111)	(0.283)	(0.100)	(0.294)
Marginal Effects[(a)]		−0.108		0.092		0.013
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	162	145	137	124	138	121
R-squared	0.207		0.226		0.263	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

C) Jobs Quality Conditions

Subsample I

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.003	−0.020	0.004	0.205	0.006	0.264	0.022*	0.316*	0.042**	0.995*	−0.002	−0.069	0.042*	0.204*
	(0.022)	(0.128)	(0.010)	(0.230)	(0.009)	(0.246)	(0.013)	(0.173)	(0.017)	(0.578)	(0.008)	(0.261)	(0.022)	(0.114)
Marginal Effects[a]		−0.003		0.003		0.006		0.019*		0.023***		−0.000		0.043*
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,294	1,289	1,291	1,286	1,293	1,283	1,293	1,288	469	363	1,288	1,203	1,294	1,289
R-squared	0.184		0.273		0.112		0.193		0.278		0.127		0.093	

Subsample III

	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit[b]	OLS	Probit[b]	OLS	Probit[b]	OLS	Probit	OLS	Probit[b]	OLS	Probit	OLS	Probit
Access to a Footbridge	0.266***	—	0.080	—	0.105**	—	0.153**	1.011***	0.146*	—	0.062	3.076**	0.102*	1.256**
	(0.070)	—	(0.055)	—	(0.052)	—	(0.067)	(0.366)	(0.080)	—	(0.046)	(1.484)	(0.060)	(0.547)
Marginal Effects[a]		—		—		—		0.139**		—		0.000		0.012
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	103	—	103	—	103	—	103	87	62	—	102	47	103	92
R-squared	0.468		0.536		0.397		0.434		0.585		0.382		0.519	

	Subsample IV													
	Written Contract		Pension Fund		Paid Vacation Leave		Paid Sick Leave		Maternity Leave		Medical Benefits		Permanent Job	
	OLS	Probit	OLS	Probit[b]	OLS	Probit[b]	OLS	Probit	OLS	Probit	OLS	Probit[b]	OLS	Probit
Access to a Footbridge	0.079	0.588	−0.001	—	0.033*	—	0.046	0.666	0.034	0.177	0.020	—	0.033	0.312
	(0.054)	(0.431)	(0.030)	—	(0.018)	—	(0.040)	(0.638)	(0.059)	(0.650)	(0.013)	—	(0.046)	(0.391)
Marginal Effects[a]		0.085		—		—		0.087			0.012	—		0.027
Controls														
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	180	155	180	—	180	—	180	75	117	37	179	—	180	170
R-squared	0.269		0.476		0.254		0.301		0.384		0.215		0.231	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

(b) The data do not permit estimating a Probit model due to perfect prediction of the variable ‘Access to a Footbridge’ (that is, the outcome variable is perfectly separated by ‘Access to a Footbridge’).

D) Wages

	Subsample I	**Subsample III**	**Subsample IV**
	Last Wage Payment	Last Wage Payment	Last Wage Payment
Access to a Footbridge	98.61	1,546	558.4
	(215.9)	(1,463)	(368.3)
Controls			
Individual	Yes	Yes	Yes
Education	Yes	Yes	Yes
Household	Yes	Yes	Yes
Geographic	Yes	Yes	Yes
Observations	526	43	73
Without Footbridge (Mean)	1,939.1	768.6	1,379.7
R-squared	0.311	0.672	0.856

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

E) Poverty Status

	Subsample I		**Subsample II**		**Subsample III**		**Subsample IV**	
	Poverty Status		Poverty Status		Poverty Status		Poverty Status	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.141***	−0.458***	−0.102**	−0.398**	−0.132**	−0.582***	−0.061	−0.219
	(0.020)	(0.065)	(0.050)	(0.184)	(0.062)	(0.224)	(0.052)	(0.171)
Marginal Effects[(a)]		−0.163***		−0.119**		−0.185**		−0.075
Controls								
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,659	2,648	355	346	233	217	342	332
R-squared	0.158		0.177		0.298		0.198	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

F) Consumption

	Subsample I	**Subsample II**	**Subsample III**	**Subsample IV**
	Consumption Per Capita	Consumption Per Capita	Consumption Per Capita	Consumption Per Capita
Access to a Footbridge	107.6***	74.63**	114.2*	91.40**
	(17.36)	(32.34)	(65.90)	(40.88)
Controls				
Individual	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes
Observations	2,659	355	233	342
Without Footbridge (Mean)	451.21	375.33	467.84	427.12
R-squared	0.371	0.278	0.409	0.257

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

G) Agricultural Production for Sale

	Subsample I		**Subsample III**		**Subsample IV**	
	Agricultural production planned for Sale		Agricultural production planned for Sale		Agricultural production planned for Sale	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.106**	−0.353***	-0.507	−5.996*	0.178	0.600
	(0.0429)	(0.133)	(0.609)	(3.378)	(0.137)	(0.509)
Marginal Effects[(a)]		−0.110***		−0.274		0.178
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	572	30	27	68	67
R-squared	0.069		0.517		0.306	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

H) Occupations Level

	Subsample I					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.008	0.040	−0.013	−0.043	0.001	0.124
	(0.040)	(0.110)	(0.041)	(0.110)	(0.005)	(0.176)
Marginal Effects[(a)]		0.016		−0.017		0.001
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	864	855	864	863	2,659	2,653
R-squared	0.172		0.124		0.245	

	Subsample III					
	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	−0.123	−0.408	0.097	0.343	0.005	1.037**
	(0.152)	(0.521)	(0.151)	(0.480)	(0.027)	(0.468)
Marginal Effects[(a)]		-0.161		0.130		0.000
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	83	74	83	75	233	143
R-squared	0.389		0.366		0.313	

	Subsample IV

	Level 1 Occupations		Level 2 Occupations		Level 3 and 4 Occupations	
	OLS	Probit	OLS	Probit	OLS	Probit
Access to a Footbridge	0.136	0.175	−0.102	−0.071	−0.008	−0.437
	(0.097)	(0.273)	(0.095)	(0.275)	(0.016)	(0.379)
Marginal Effects[(a)]		0.070		−0.027		−0.007
Controls						
Individual	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Household	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Observations	138	133	138	133	342	241
R-squared	0.381		0.376		0.486	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: (a) Probit marginal effects at the means.

Appendix IV – List of Variables

Outcomes	Definition
Time to get to school (Minutes)	Time to get to the school by walking (minutes).
Time to get to health care center (Minutes)	Time to get to the health care facility (minutes)
Employed	Dummy variable indicating whether the individual is employed.
Paid Employee	Dummy variable indicating whether the individual is a paid employee.
Employment on Agriculture Sector	Dummy variable indicating whether the individual is employed in the agriculture sector.
Written Contract	Dummy variable indicating whether the individual is employed based on a written contract.
Employer Contribute to Pension Fund	Dummy variable indicating whether the employer contributes to any pension/retirement fund/gratuity.
Paid Vacation Leave	Dummy variable indicating whether the job is entitled to paid vacation leave.
Paid Sick Leave	Dummy variable indicating whether the job is entitled to paid sick leave.
Maternity Leave	Dummy variable indicating whether the job is entitled to maternity leave.
Medical Benefits	Dummy variable indicating whether the job is entitled to medical aid benefits.
Permanent Job	Dummy variable indicating whether the job contract/agreement is of permanent duration.
Last Wage Payment	The monetary value of the last monthly payment received (Maloti).
Poverty Status	Dummy variable that indicates whether the individual declares himself poor.
Consumption Per Capita	The monthly consumption per capita (Maloti).
Level 1 Occupations	Dummy variable indicating whether the job position is classified as a Level 1 skill level occupation (ISCO-08 classification).
Level 2 Occupations	Dummy variable indicating whether the job position is classified as a Level 2 skill level occupation (ISCO-08 classification).
Levels 3 and 4 Occupations	Dummy variable indicating whether the job position is classified as a Level 3 or 4 skill level occupation (ISCO-08 classification).
Agricultural production planned for Sale	Dummy variable indicating whether part/total of the agricultural production is planned for sale.
Variable of Interest	**Definition**
Access to a Footbridge	Dummy variable indicating whether the household had access to at least one footbridge before the program implementation.
Controls	**Definition**
Individual Level	
Gender	Dummy variable whether the individual is female.
Age	Age
Marital status	Variable indicating the individual's marital status.
Social position	Variable indicating the individual's social group.
Educational Level	
Education level	Variable indicating the highest education level achieved.
Years of education	The number of years of formal education completed.
Household Level	
Own house	Dummy variable indicating whether the household owns the residence.
Water	Dummy variable indicating whether the household has access to piped water.
Electricity	Dummy variable indicating whether grid electricity is the main source for lighting.
Toilet	Dummy variable indicating whether flush to piped sewer system is the main sanitation facility used by the household.
Landline	Dummy variable indicating whether any member of the household owns a landline.
Cellphone	Dummy variable indicating whether any member of the household owns a cellphone.
Computer	Dummy variable indicating whether any member of the household owns a computer.
Car	Dummy variable indicating whether any member of the household owns a vehicle.
Household size	The number of individuals in the household.
Geographic Level	
Region	Variable indicating the household geographic region.
Distance to the closest district's capital	Distance (km) to the nearest district's capital of Lesotho.
Natural shocks: drought/floods	Dummy variable indicating whether the household's economic situation was severely affected by drought or flood in the last 5 years.

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