Linking Tourism Development with Residents' Well-being through Livelihood Capitals in Northern Tanzania

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Abstract: This study aimed at evaluating the link between tourism development, well-being and residents' access to livelihood capitals when confounding variables are controlled. The study used the quasi-experimental design. Well-being condition was determined through the Livelihood Capital Index after controlling for socio-economic covariates among matched samples of 413 tourism beneficiaries and 421 non-beneficiary agro-pastoralists living in three gateway tourism destination communities namely Burunge, Lake Natron and Loliondo in Northern Tanzania. Selected communities experienced a development stage of tourism destination life cycle. This study largely relied on analysis of quantitative data by calculating the Livelihood Capital Index. However, qualitative data from 24 key informants, through Focus Group Discussions complemented the quantitative data. The study established that linkage between tourism development and well-being is facilitated with residents' access to livelihood capitals. Basing on difference in the average treatment effect of 0.087 (8.7%) in the livelihood capital index, which was statistically significant (p <0.001), the study concluded that residents' well-being as a function of livelihood capital status is enhanced more with tourism than without tourism, especially in financial, social, physical and human capitals. Therefore, the study recommended that efforts to sustain tourism development in enabling resident access to livelihood capitals that underpin their well-being should strike a balance between residents' need for cultivation and grazing at one hand and tourism investment on communal land on the other hand.

Keywords: Tourism Development; well-being; livelihood capitals; Northern Tanzania.

Introduction

Tourism has been one of the key sectors in promoting economic growth among developing countries within the last two decades (Odhiambo & Nyasha, 2020). The justification to use tourism in the development policy agenda among developing countries is premised on its ability to create employments, income tax, foreign currency earnings and other multiple direct and indirect benefits (Folarin & Adeniyi, 2020; Woyo & Musavengane, 2023). For instance, tourism was reported to generate cumulative amount of 2.5 million jobs in North Africa and 6.8 million jobs in Sub Saharan

Africa (SSA) in 2017 (African Tourism Monitor, 2018). Moreover, tourism was reported to be either first or second in export earnings, thus contributing to above the quarter of GDP among the poorest countries (UNWTO, 2018). Therefore, nurturing tourism and its development can be a promising path for further economic growth and achievement of national development visions as well as Sustainable Development Goals (SDGs) by 2030.

Despite the immerse contribution of tourism in economic growth among developing countries, it is worth noting that Sub Saharan Africa is among the world's regions whose residents' well-being is still

poor (Azzarri & Signorelli, 2020). Therefore, there is a need to evaluate the link between tourism development and local residents' well-being beyond the reported economic aspects such as tax revenue, foreign currency earnings and GDP (Scheyvens & Hughes, 2019).This link is not adequately understood due to limited empirical evidence that measures causal relationship between tourism development, livelihood capitals and improved well-being in the SSA gateway communities (Woyo & Musavengane, 2023) and particular, Tanzania (Mwongoso et al., 2023a). It is important to note that previous studies (Mbaiwa & Stronza, 2010; Agyeman et al., 2019; Mwongoso et al., 2023a) employed appropriate approach, namely sustainable livelihood framework (SLF) to evaluate the stated link in the SSA gateway communities (i.e. communities bordering with famous protected areas that serves for nature-based tourism attractions). However, these studies did not control for confounding variables, thus, explanation about livelihood outcome variable (i.e. improved well-being) suffered from stringent statistical counterfactual analysis.

Counterfactual analysis entails comparing the average outcome of intervention (i.e. tourism intervention) with average outcome that would have been achieved if the intervention had not been implemented. This analysis calls for comparison on outcome variable (i.e. well-being) between groups with and without tourism benefits after controlling for confounding variables through group matching procedures. The results of this analysis serve the purpose of providing feedback to policy makers on effectiveness of tourism intervention in improving well-being of rural communities as livelihood outcome towards achievement of Tanzania vision 2025 and SDG 2030. It is on these grounds this study was conducted.

Theoretical Underpinnings
This study was guided by livelihood capital asset theory in the context of sustainable livelihood framework (SLF). The UK Department pioneered the SLF for International Development (DFID, 1999) and since then, it has become a popular livelihood analytical tool (Su et al., 2019). In the context of SLF, livelihood is defined as capabilities, assets (i.e materials and non-material resources) and activities required for a means of living (Chambers & Conway, 1992).The SLF is useful in describing socio-economic and environmental shocks and perturbations causing livelihood vulnerability. Then, it illustrates

how poor people address vulnerable context using livelihood assets (social, human, natural, physical and financial resources) through established laws, processes, structures and policies that aims to create livelihood strategies (e.g, tourism) in order to achieve livelihood outcome (i.e. increased income, improve well-being, reduce vulnerability, improve food security and more sustainable use of natural resources). The pillars of SLF are the livelihood capital assets: social (e.g, social relations), human (e.g, health, education and size of laborers), financial (e.g. salary, loans and savings), physical (e.g, livestock, consumer durables and house structures) and natural assets (e.g, land and wildlife resources).

Given that the focus of this study is to link tourism with residents' livelihood capitals towards well-being, thus, the livelihood capital asset theory is relevant in framing well-being as an outcome of access to livelihood capitals. Livelihood analysis literature contends that ownership of sufficient livelihood capital assets builds capabilities of households to withstand shocks, causing vulnerability to poverty, consequently improving the well-being (Brockington et al., 2018; Howland et al., 2021). Based on this premise, the proposition underpinning this study contends that improved well-being is a function of households' possession of adequate stock of livelihood capital assets.

Methodology
Study Areas
This study involved 16 villages in three gateway communities (GCs): Burunge, Loliondo and Lake Natron. In this study, GC refers to a village or combination of neighboring villages with similar cultural and topographical features. As part of Protected Area (PA) Ecosystem of Northern Tanzania, Burunge is located in the wildlife migratory corridor between Tarangire and Manyara National Parks of Northern Babati District in Manyara Region. Loliondo and Lake Natron GCs are gateways to the World Natural Heritage sites of Serengeti National Park and Ngorongoro conservation area of Ngorongoro District in Arusha region. The agro-pastoral Maasai natives constitute 95% of residents in Loliondo and Lake Natron and 28% in Burunge, where they interact with 60% of Mbugwe agro-pastoralists along with minority ethnic groups of Warangi, Iraque and the hunter-gather Barbaig group(Babati District Council, 2015; Ngorongoro District Council, 2016).

The studied GCs are typical semi-arid with Savana Grassland. Thus, livelihood strategy like tourism may diversify livelihood options required to minimize vulnerability to low productivity from traditional agro-pastoralism. Residents in these GCs have more than two decades of tourism experience, which, over the years, has transformed these GCs from exploration, involvement and development stages of tourism life cycle (Mwongoso et al., 2021). Tourism activities conducted through the course of development include selling of cultural handcrafts, performing traditional dances to tourists, involvement in game-viewing activities, walking safaris, bird-watching and hunting along with camping and lodging (Mwongoso et al., 2021).

Design
The study employed the quasi-experiment design. This causal impact evaluative design involves combination of treated and untreated units. Households and villages participating in particular intervention (i.e. tourism activities) constituted the target 'treated' group or tourism beneficiaries. Households residing outside the target villages, and thus, are not participating and also not benefiting by the intervention were considered as 'untreated' or non-beneficiaries (Khandker et al., 2009).The justification to use the non-beneficiary group was on counterfactual analysis, referring to determining what conditions of well-beings would be among residents in the tourism beneficiary village/households, had they not been participating and getting benefits from tourism intervention. In other words, an estimate of average livelihood capitals that constitute well-being among non-beneficiary households indicates well-being status at absence of tourism.

Population and Sampling
Two stages were involved to subject the population that produced the sample. In the first stage, nine beneficiary and seven non-beneficiary villages emerged from 29, 17 and 28 villages constituting three divisions: Loliondo and Sale (Ngorongoro District) and Mbugwe (Babati District) respectively. The beneficiary and non-beneficiary villages were purposely selected based on similarity in ethnicity, livelihood activities and tourism attractions such as socio-cultural, wildlife view and scenic beauty. Similarity criteria was necessary in order to comply with the principle of impact evaluation, which recommends that non-beneficiary and beneficiary areas should be similar in socio-economic features in order to make unbiased comparison. Thus,

beneficiary villages included Vilima Vitatu, Olasiti, Sangaiwe, Kakoi and Mwada from Burunge; Sukenya, Arash and Ololosokwan from Loliondo and one village, Engaresero from lake Natron. Non-beneficiary villages were Soitsambu, Olorien-Magaiduru and Njooroi from Loliondo; Kisangaji, Minjingu and Sarame from Burunge and Pinyinyi from lake Natron GC. In the second stage, the researchers constructed a sample frame of household heads from updated village registries. The sample frame from Burunge included 1,177 and 1,102 beneficiary and non-beneficiary, respectively, 1634 beneficiary and 827 non-beneficiary household heads from Loliondo and 588 beneficiary and 968 non-beneficiary household heads from lake Natron GC. These sample frames were used to calculate sample size.

Sample Size
The researcher calculated the household sample size using a formula suitable on small sample sizes corrected for a finite population as proposed by Daniel and Cross (2013). The researchers selected the sampled households from constructed household sample frames, using the random number table. As the result, 146 beneficiary and 150 non-beneficiary households from Burunge, 164 beneficiary and 169 non-beneficiaries from Loliondo and 108 beneficiary and 113 non-beneficiary households from Lake Natron constituted sample sizes, making the total sample of 850 respondents (i.e. 418 tourism beneficiaries and 432 non-beneficiary households).

Instrument
The researchers administered a household questionnaire to respondents through the face-to-face approach. The items in the questionnaire captured households' demographic characteristics, then, household possession of key livelihood capitals' quality and quantity. The capital assets included house structure, number of cattle, size of land cultivated and certainty of food availability, to mention a few. The capital assets included house structure, number of cattle, size of land cultivated and sources of financial capital, to mention a few. The list of five livelihood capitals in the questionnaire with their respective 15 indicators appear in Table 1.

Validity and Reliability
Content validity ensured items in the questionnaire are set to capture relevant data on livelihood capitals along with their indicators. The researchers

did the intensive review of literature on livelihood capital assets followed by a pilot study in order to ensure clarity and relevance of the questions. Prior to the major analysis, data validity was checked trough normality and outliers test, using Z-scores and histogram in order to meet the statistical assumptions required in determining the average difference in livelihood capitals between tourism beneficiary and non-beneficiary groups. Two respondents from beneficiary group had outliers while seven respondents from the non-beneficiary group had incomplete responses. Thus, the researchers excluded the nine respondents from the major analysis, which reduced the sample size from 850 to 841.

The researchers checked the reliability of data through split half test with Spearman-Brown correlation. The researchers divided the 15 items/indicators reflecting livelihood capital assets in the questionnaire into two halves. Then, the correlated the scores from each half to determine the internal consistency. Results produced a coefficient of 0.84 (84%) entailing high reliability.

Ethical Considerations
The researchers ensured ethical issues before, during and after the data collection sessions. Before administering the questionnaire, the research permit was sought from respective regional and district authorities. Furthermore, informed consent through respondents' permission was adhered after explaining the purpose of the study. The researchers further maintained the anonymity and confidentiality of respondents.

Statistical Treatment of Data
This study largely relied on the analysis of quantitative data (i.e. calculating quantity of livelihood capitals underpinning well-being) given study objectives. However, qualitative data from 24 key informants, through focus group discussions (FGDs) complemented the quantitative data. Qualitative data were transcribed and analyzed thematically, reflecting on access, use and perceived quality of livelihood capitals. Quantitative data analysis focused on computing the Livelihood Capital Index (LCI). To achieve this goal, each indicator of livelihood capital was standardized (Table 1) to set them in the same scale, using the following expression:

$$LC_{jm} = \frac{LC'_{jm} - \min LC'_{jm}}{\max LC'_{jm} - \min LC'_{jm}}$$ where LC_{jm} stand for normalized value of m indicator in the j capital; LC'_{jm} represent initial value of m indicator in the j capital. Then, the average value of capital j was calculated as: $LC_j = \sum LC_{jm}/m$. Lastly, the LCI of household i was expressed by: $LCI_i = \sum_{j=1}^{5} W_j LC_{ij} (i \in 1,2,..841; j \in 1.2,...,5)$ where LCI_i entail the overall livelihood capital index of

household i, W_j is the weight of livelihood capital j which was calculated using Entropy method (Table 1). The LC_{ij} is the livelihood capital j of household i. The computed LCI values (Table 5) range between 0 and 1, where lower LCI value entails a lower level of livelihood capital.

Next, the researcher conducted the statistical group-matching using propensity score matching (PSM) procedures to ensure that the beneficiary and non-beneficiary groups do not significantly differ in terms of socio-economic characteristics that may influence participation in tourism and access benefits. The PSM is useful in selecting matched groups that have similar probabilities (i.e. propensity scores) of receiving intervention benefits (Gertler et al., 2016) in order to control for confounding variables and make fair group-comparison. In this study, PSM refers to the

conditional probability that a local resident receives benefits from tourism initiatives, given set of socio-economic covariates such as education, age and sex of respondents. Through review of relevant literature (Mugizi & Obua, 2017; Ogunjinmi & Braimoh, 2018; Paudyal et al., 2018; Wanyoike et al., 2015) eight variables were obtained and used as predictor covariates (see Table 2 for details on measurement of variables used).

Table 1. Livelihood Capitals, Indicators and Respective Weights

Capital and indicators	Measurement	Weights for Beneficiary	Weights for Non-beneficiary
Human capital			
Labour force	Number of active household members	0.1192	0.1568
Level of education	1=informal:2=primary;3=secondary;4=high school;5=College/University	0.0730	0.0102
Health condition	Any household member often in need of health-care:(1=yes:0=no)	0.0080	0.0330
Social capital			
Association-membership	Any household member affiliated to social organization: (1=yes:0=no)	0.0276	0.0220
Relative and friends support	Number of relative/friends support when needed: (0=no; one to 2=1;more than 2 supporters=2)	0.1722	0.1880
Physical capital			
Own motorbike	Owned motorbike: (1=yes:0=no)	0.0096	0.0065
Own plough	Owned: plough (1=yes:0=no)	0.0004	0.0041
Own radio	Owned: radio (1=yes:0=no)	0.0080	0.0095
Number of livestock	Total tropical livestock units (TLU); (LU= 0.1=goat/sheep;0.7 goats/sheep=1 cattle)	0.1560	0.1629
House structure	Materials used to construct house: (1=earth floor, mud walls, grass-roof;2=concrete floor, brick-walls, metal sheet-roof;3= concrete floor, block-walls, metal sheet-roof; 4=tiled floor, block walls, galvanized sheet)	0.0260	0.0171
Natural capital			
Grassland for grazing	Access adequate grassland for grazing: (1=yes:0=no)	0.1562	0.0474
Cultivated land	Land cultivated in acres: (0=not cultivate;1=less than 2 acres;2=2-4'3=5-10 acres;4=more than 10 acres).	0.0438	0.1826
Financial capital			
Salary job	Any household member with salary job: (1=yes:0=no)	0.0182	0.0044
Access loan	Any household member access loan: (1=yes:0=no)	0.0146	0.0100
Cash income	Estimated per capita annual cash earnings from different sources like enterprise profit, livestock and crop sales, off-farm and non-farm income	0.1672	0.1456

PSM steps include estimation of propensity scores using logistic regression model (Table 3), choosing a matching algorithm, checking on common support region and testing the matching balances (Table 4). This study followed all these steps whereby Kernel density function, an efficiency matching estimator as recommended by Powell-Jackson and Hanson (2012) was used apart from other estimators like Nearest Neighbor, Caliper and Stratification. Consequently, three and four respondents from beneficiary and non-beneficiary groups, respectively, were discarded from the Kernel

matching procedures because their propensity scores were distinct and fell out of the region of common support. Eliminating the unmatched respondents was necessary to satisfy the assumption of common support requirements. Therefore, the sample size used for major analysis (i.e. determining average treatment effects) was reduced to 413 and 421 for beneficiary and non-beneficiary respondents, respectively, making the 834 matched households as number of observations shown in Table 5.

Lastly, the average treatment effects on treated (ATT in Table 5) was calculated by maintaining the matches to the households with propensity scores that fall in the area of common support as follows:

$$ATT = E(Y_1 - Y_0 / Z_i) = E(Y_1 / Z_i = 1) - E(Y_0 / Z_i = 1)$$

where: Y_1 is the outcome (well-being derived from LCI status) in the beneficiary condition; Y_0 is the outcome in the non-beneficiary condition; and the Z_i indicator variable (treatment status) entails beneficiary of tourism initiatives. Thus, significance positive difference in ATT would be attributed to tourism intervention.

Results and Discussions

This section presents and discusses findings. The results and discussion section begins with the presentation of demographic factors.

Demographic Profile

Table 2 contains the combined summary statistics of beneficiary and non-beneficiary socio-economic characteristics and description about measurements of these variables. The results show that male headed households accounts for 0.785 (78.5 %) with the average age of 43.793 years. Some household heads attained primary education with the mean of 1.728 (i.e. average close to 2=primary) while 0.568 (56.8%) average of at least 1 household laborers attained secondary education, implying positive impacts of the education policy in achieving basic education in Tanzania. Furthermore, there was a good number of adult household labor-force of 5.859, an average close to 6 people indicating adequate supply of laborers, although lowly involved in social group-membership with the mean score of 0.169 which is less than 1 for binary response answer (1=yes;0=no). Generally, the health status was good with the average of 0.281 or 28.1% for household members requiring intensive health care.

Table 2. Summary statistics of respondents' socio-economic characteristics.

Variable	Description	Mean	SD
Sex of house hold head	1=male;0=female	0.785	0.411
Age of house hold head	Years	43.793	8.729
Education of house hold head	1=informal:2=primary; 3=secondary;4=high school;5=College/University	1.728	0.892
Education of house hold laborers	Number of household laborers with secondary education	0.568	0.483
Number of adult productive laborers	Number	5.859	1.940
Health status of house hold members	Any household member often in need of health-care:(1=yes:0=no)	0.281	0.450
Membership to social groups	Any household member affiliated to social organization: (1=yes:0=no)	0.169	0.375
Involved in tourism jobs	1=yes;0=no	0.155	0.461
Total livestock units owned by household	Tropical livestock units (TLU); (LU= 0.1=goat/sheep;0.7 goats/sheep=1 cattle)	38.666	25.832

Variable	Coefficients	SD	Z	P-value
Sex of house hold head	-0.310**	0.118	-2.620	0.009
Age of house hold head	-0.010	0.007	-1.480	0.138
Education of house hold head	0.399***	0.086	4.630	0.000
Education of house hold laborers	0.465***	0.098	4.760	0.000
Number of adult productive laborers	-0.161**	0.055	-2.940	0.003
Health status of house hold members	-0.442***	0.117	-3.790	0.000
Membership to social groups	0.247	0.156	1.580	0.114
Total livestock units owned	0.008**	0.003	2.590	0.010
Constant	-0.153	0.347	0.440	0.658
Log-likelihood		-516.564		
Pseudo R^2		0.115		
Observations		841		

*$p < 0.10$; **$p < 0.05$ and ***$p < 0.001$

The results also indicate the score of 0.155(15.5%) equivalent to 129 out of 834 total sample household members directly earning their living through tourism jobs. Thus, tourism had diversified livelihood options. Worth noting, there was a good possession of livestock, measured on Tropical livestock units (TLU), amounting to an average of 38.666. The TLU indicates level of possessing livestock that can be associated with decent living among pastoralists in the Northern Tanzania (Manzano & Yamat, 2018). A higher TLU implies adequate wealth since livestock is a primary source of wealth in pastoral community (Slootweg, 2018).

Results of Propensity Score Matching
Table 3 presents the results of the logistic sample selection model, determining the likelihood for resident's participation in tourism. The set of variables (i.e. quantity of livestock possessed, age, sex, health status, education level of household heads) shown in Table 2, describing respondent's characteristics were also used as input (independent variables) in logistic regression to predict whether a household would receive tourism benefits (i.e. beneficiary=1) or otherwise (i.e. not beneficiary=0), using propensity scores. The results show that six out of eight variables were significant predictors with positive and negative coefficients.

For instance, sex of household heads had a negative and significant influence to participate in tourism, implying that female household heads were less likely to participate compared to their male counterparts. Possible reason is that females in pastoral communities have adequate domestic duties, which may reduce time for their participation (Wanyoike et al., 2015).

Number of adult productive laborers and health status were among the significant negatively predictors of participation. This means, active laborers are likely to engage in other labor-intensive jobs apart from tourism while household with members often sick requires constant care from other members, thus affecting the time to be involved in tourism activities. Moreover, contrary to Ogunjinmi and Braimoh (2018), it was found that membership to social groups do not significantly influence participation in tourism. The possible reason could be that the existing social groups and social networks offer social support to its members on matters less relating to tourism conduct.

The significant positive predictors to participate include level of education and size of livestock owned. The results indicate livestock units owned by household (*p*= 0.010) and the level of formal education attained by both household head and laborers (*p*= 0.000). In the context where availability of formal education services is scant, residents with minimum level of formal education, possibly at secondary level, are more likely to be employed in tourists' lodges, working as tour guides or making positive decisions to welcome tourism investors on their communal lands. Similarly, the households with adequate size of livestock are likely to be involved in tourism activities like production and selling handcrafts items to tourists because they can easily sell cows and access financial-capital for starting a tourism based small-enterprises.

A fair comparison on well-being derived from LCI status between beneficiary and non-beneficiary groups should be preceded with testing for group-matching balances as a critical step in PSM procedures. This test aimed to confirm whether groups do not significantly differ in terms of socio-economic characteristics. Table 4 presents the results of the balance test before and after matching. The results show that before matching, the beneficiary and the non-beneficiary groups were systematically different in terms of some observed characteristics like age (mean difference of -3.726 units with $p < 0.001$), livestock units (mean difference of 4.55 units with $p < 0.05$), education

level (mean difference of 0.489 and 0.187 with $p < 0.001$) and health status of laborers (mean difference of -0.176 with $p < 0.001$). The significant differences in the characteristics between groups implies biased estimate of average outcome because results would be calculated from incomparable groups. After employing the Kernel-based matching technique, none of the mean differences of the selected variables between beneficiary and non-beneficiary households were statistically significant, even at the 10% level, suggesting that the balancing property of the covariates was satisfied (Ma et al., 2018).

Table 4. Results of Balance Test of the Unmatched and Matched Samples Using Kernel-Matching

Variable	Unmatched sample			Matched sample (ATT)		
	Average value of Beneficiary group	Average value of Non-beneficiary Group	Diff[1]	Average value of Beneficiary group	Average value of Non-beneficiary Group	Diff[1]
Sex of house hold head	0.776	0.794	-0.018	0.768	0.777	-0.009
Age of house hold head	36.882	40.608	-3.726***	37.124	37.257	-0.133
Education of house hold head	1.946	1.457	0.489***	1.841	1.774	0.067
Education of house hold laborers	0.489	0.302	0.187***	0.472	0.434	0.038
Number of adult productive laborers	4.345	4.706	-0.361**	4.356	4.393	-0.037
Health status of house hold members	0.156	0.332	-0.176***	0.162	0.181	-0.019
Membership to social groups	0.137	0.134	0.003	0.135	0.133	0.002
Total livestock units owned	34.45	29.9	4.55**	33.852	33.714	0.138

Diff[1] is the difference between the beneficiary and non-beneficiary group; *$p < 0.10$; **$p < 0.05$ and ***$p < 0.001$.

Table 5. Impact of tourism on livelihood capitals

Treatment	Group	Livelihood Capital Index	Human Capital	Social Capital	Physical Capital	Natural capital	Financial Capital
Treatment Status	Non-beneficiary group	0.364	0.378	0.320	0.380	0.400	0.330
	Beneficiary Group	0.451	0.480	0.490	0.470	0.360	0.450
Treatment effects	Diff[1]	0.087***	0.102***	0.170***	0.090***	-0.040**	0.120***
t-stat		6.170	3.560	4.200	6.390	4.120	3.980
Observations	834	834	834	834	834	834	834

Diff[1] is the difference between the beneficiary and non-beneficiary group; *$p < 0.10$; **$p < 0.05$ and ***$p < 0.001$.

Tourism Impact on Residents' Well-being

Table 5 presents the average treatment effects, using the PSM approach. The results show that the livelihood capital index for households in the beneficiary group was 0.451 and that for households in the non-beneficiary group was 0.364. The average treatment effect (ATT) on residents' LCI was 0.087, which was statistically significant (p <0.001) implying that the LCI for households in the beneficiary households was significantly higher than that in the non-beneficiary households.

With exception to natural capital, tourism conducted in GCs improved the financial, human, social and physical capital. The results in Table 5 show that the mean score of human capital for residents in the beneficiary group was 0.480 and 0.378 for non-beneficiary. The average treatment effect (ATT) on human capital was 0.102 statistically significant (p <0.001). This imply, being a tourism beneficiary, a household receives benefits including health and education services from community projects financed from tourism receipts at the village level, thus, enhanced their human capital. These results are consistent with findings by Mwongoso et al (2023b). From site observation, where there is at least two dispensaries or health centers and a primary and secondary school established using tourism revenue to each beneficiary village while there was a single dispensary, primary and secondary school facilities at the ward level for non-beneficiary households.

The mean score of social capital for households in the beneficiary group was 0.490 contrary to 0.320 of non-beneficiary. The ATT on social capital was 0.170, statistically significant (p <0.001). This result is basing on the fact that tourism beneficiary households consider and prioritize social groups and social networking more than non-beneficiary households prioritize. Availability of women groups producing and selling handcrafts items to tourists and traditional dancing groups providing entertainment services to tourists, are among the examples of social groups available in the beneficiary households. Members in these social groups normally provide moral and physical support to a member experiencing life-shocks (i.e. accidents and deaths) and perturbations, thus, increased their social capital.

The mean score of financial capital for the beneficiary group was 0.450 while that for the non-beneficiary group was 0.330. The ATT on financial capital was 0.120 and was statistically significant (p <0.001). There are some reasons for this finding. Firstly, beneficiary households with member directly employed in tourism ensure diversification of sources of income through salary, in addition to household earning income from merely selling goats and cows. Secondly, individual access of income from tourism is re-invested in small business enterprises, thus guarantee increase of financial capital (see also in Agyeman et al., 2019). Thirdly, during focus group discussions (FGDs), it was noted that availability of multiple sources of income within beneficiary villages stimulates formation of rotating saving and credit associations (ROSCAS), where members' access loans rotationally following regular savings.

The physical capital index mean was 0.470 for beneficiary compared to the mean of 0.380 for non-beneficiary. The ATT was 0.090 was significant (p <0.001). The possible reason is due to increase in physical assets like livestock, which is a symbol of wealth in pastoral communities (Slootweg, 2018). During FGD, it was revealed that, households directly involved in tourism earn income that is spent on purchasing more cows, goats, radio, motorbikes, ploughs and constructing houses. The household thus enhanced their physical capital.

As for natural capital, the mean score of natural capital for the beneficiary group was 0.360, while that for the non-beneficiary group was 0.400. The ATT on natural capital was -0.040 and was statistically significant (p <0.05). This finding indicates that the beneficiary group compared to the non-beneficiary group did not access and utilize the natural capital like land, thus, their natural capital was lower than that of the non-beneficiary group. This is because, being a tourism beneficiary in GCs, a household is subjected to restriction in land-use for grazing and cultivation as some portions of communal land is set aside for tourist utilization. This interpretation fits well with the claims of Agyeman et al. (2019) and Keane at al. (2020) about imposing livelihood costs following community conservation initiatives that firmly restrict residents to use natural resources.

Conclusions and Recommendations

The study concludes that quantity of livestock possessed, sex of household head, health status of household members, education level of household heads, education level of household members and number of adult productive laborers, are critical confounding variables that significantly predict residents' likelihood to participate and access tourism benefits. Thus, it is concluded that efficacy of tourism development in GCs is premised on the intensity of these variables. Therefore, the study recommends that tourism development plans in GCs should embrace these variables as key components.

Secondly, the linkage between tourism development and well-being is facilitated with residents' access to livelihood capitals. Basing on significant differences on LCI between tourism beneficiaries and non-beneficiaries, the study concludes that residents' well-being as a function of livelihood capital status improves more with tourism than without tourism, especially in financial, social, physical and human capitals. Therefore, the study recommends that efforts to sustain tourism development in enabling resident access to livelihood capitals should be sensitive to the natural resource utilization. This entails striking a balance between residents' need for cultivation and grazing at one hand and tourism investment on communal land, on the other hand. This calls for encouraging agro-pastoralists adaptation of their livestock breeding and grazing practices in the limited land while other portion of communal land sustains nature-based tourism activities.

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