WELL-BEING IN A SUSTAINABLE ECONOMY REVISITED

The role of communities: The link between social capital, economic growth and well-being in Sub-Saharan Africa

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Abbreviations and Acronyms

Abbreviation	Fully written
AA	Alcoholic Anonymous
CRE	Correlated Random Effects
DSA	Daily Subsistence Allowance
EFA	Exploratory Factor Analysis
FE	Fixed Effects
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GWP	Gallup World Poll
HBS	Mainland Household Budget Survey

HFWMPS	Tanzania High Frequency Welfare Monitoring Phone Survey
IG	Interview Guide
IS	Interview Schedule
LS	Life Satisfaction
MAE	Mean Absolute Error
MSE	Mean Squared Error
MSPSS	Multidimensional Scale of Perceived Social Support
NACADA	National Authority for the Campaign Against Alcohol and Drug Abuse
NACOSTI	National Commission for Science Technology and Innovation
NBS	National Bureau of Statistics
NPS	National Panel Survey
OLS	Ordinal Least Squares
PA	Positive Affect
PANAS	Positive and Negative Affect Schedule
PA-LE	Positive Affect Life Evaluation
PPP	Purchasing Power Parity
PReSUD	Person Recovering from Substance Use Disorder
PWI	Personal Wellbeing Index
RCM	Rehabilitation Centre Manager
RE	Random Effects
RMSE	Root Mean Square Error
SD	Standard Deviation
SDG	Sustainable Development Goal
SHAP	SHapley Additive exPlanations
SSA	Sub-Saharan Africa
SSG	Social Support Group
SUD	Substance Use Disorder
SUDP	Substance Use Disorder Patient
SWB	Subjective well-being
SWLS	Satisfaction with Life Scale
UNODC	United Nations Office on Drugs and Crime
WEIRD	Western, Educated, Industrialized, Rich, and Democratic
WHR	World Happiness Report
WVS	World Values Survey
XGBoost	eXtreme Gradient Boosting

Table of Contents

List of Figures

List of Tables

Executive Summary

The report describes the interplay between social capital, poverty, and subjective well-being across Sub-Saharan Africa. The findings show that economic growth alone does not secure higher well-being. Instead, community structures play a central role in maintaining emotional resilience, even in areas where material deprivation is widespread.

The report includes:

Part A. An analysis of poverty and subjective well-being and the moderating role of social capital in Sub-Saharan Africa.

Part B. Country survey reports and papers for Kenya, Tanzania and Ghana.

Part C. An analysis of the well-being paradox known as Cheerful Discontent.

Part A: Poverty and Subjective Well-being

Using data from the 2022 Gallup World Poll, the report shows that poverty lowers both life evaluation and emotional balance. Social capital softens this impact. Strong family ties help protect life evaluation, while bridging ties, such as colleagues or wider networks, support affective well-being, particularly in urban areas.

Part B: Country Survey Reports and Papers

Kenya: A survey of people recovering from substance use disorders shows a strong link between social support and well-being. Early drug initiation and family motivation for recovery play a central role.

Tanzania: Surveys reveal a clear mismatch between high positive affect and low life evaluation. Trust plays a central role in transforming emotional experiences into higher well-being. Food insecurity remains a significant factor reducing life satisfaction.

Ghana: A survey of women vendors in the informal economy shows that vulnerability strongly predicts low well-being. Social capital offers some protection, although not equally across groups.

Part C: Cheerful Discontent

Across Sub-Saharan Africa, people tend to experience positive daily emotions but evaluate their lives poorly. The link between positive affect and life evaluation is weak. Optimism and negative affect explain most of this imbalance. Community ties help reduce negative emotions, while economic constraints limit improvements in life evaluations.

Introduction

This report forms part of the WISER Horizon Europe project, which examines how to advance well-being in a sustainable economy. Deliverable 4.5 focuses on the role that community structures play in shaping well-being in Sub-Saharan Africa, especially in environments marked by economic hardship and limited formal support systems. The work builds on close collaboration between African and European partners, drawing on both primary field surveys and internationally comparable data.

Across many countries in the region, communities act as critical foundations of resilience. When households face income instability, food insecurity or limited access to services, social networks often provide the support that formal systems cannot. These ties influence emotional well-being, help individuals cope with daily stress and can moderate the impact of poverty on life satisfaction. Understanding how these forms of social capital operate is therefore essential for designing effective policies that promote well-being and development.

The report has three main components.

- **Section A** examines the interaction between poverty and social capital in influencing life evaluation and their impact across Sub-Saharan Africa, using data from the Gallup World Poll.
- **Section B** presents evidence from three country studies, Kenya, Tanzania and Ghana, which explore the lived experience of well-being in different contexts. These surveys provide insights into substance use recovery, the emotional and material dimensions of well-being and the vulnerability faced by women in the informal economy.
- **Section C** examines the well-being paradox known as Cheerful Discontent. This phenomenon captures the pattern in which individuals report relatively positive daily emotions despite low life evaluation. The analysis identifies the factors that drive this imbalance and highlights the limits of emotional resilience in the face of persistent structural constraints.

Together, these components offer a comprehensive view of how well-being is shaped in the region. They demonstrate that while community networks continue to be a vital source of emotional support, economic conditions still impose clear limitations on improvements in life satisfaction. The findings support policies that protect social capital while addressing the material barriers that restrict progress.

Part A: Poverty and Subjective Well-being in Sub-Saharan Africa: The Moderating Role of Social Capital

1 Introduction

Economic growth for the Sub-Saharan African (SSA) region is forecast to slow to around 3.7–3.8% in 2025, with only a modest pickup expected in subsequent years (IMF, 2025). This growth rate is not enough to significantly reduce poverty or keep pace with the region's rapidly growing population. Real income per capita in 2025 is expected to remain about 2% below its most recent peak in 2015. This suggests that many households have not recovered from past economic shocks and are not seeing meaningful improvements in their living standards (IMF, 2025). Additionally, the region is struggling to create enough decent jobs for its young and growing population, which further fuels hardship and limits economic mobility (World Bank, 2025a).

In 2025, an estimated 45.5 percent of the SSA population lives below the international poverty line, defined by the World Bank as US $2.15 per day. This is a significant increase from previous estimates (37%), which reflects both new and ongoing economic challenges (World Bank, 2025b). In 2024, around 429 million people in Africa were living in extreme poverty, representing roughly a third of the region’s total population (World Bank, 2025b).

Despite persistent and widespread poverty in SSA, some countries in the region report high levels of affective well-being (Helliwell et al., 2025). Moreover, SSA countries consistently rank high on measures of prosocial behavior, such as helping strangers and volunteering, behaviors that signal strong social ties and communal networks (Helliwell et al., 2025).

This paradox, widespread material deprivation coexisting with relatively high levels of affective well-being, raises questions about what sustains happiness in low-income contexts (see also Biswas-Diener & Diener, 2006; Graham, 2009). One explanation lies

in social capital, which is broadly understood as "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (Putnam, 1995: 67). Social capital has an individual component (social ties and their functions) and a collective component (trust and social cohesion) (Portes, 2000). In this research, we focus on the individual component of social capital. Social capital may buffer the negative effects of poverty by offering both emotional and material support, thereby enabling individuals and communities to maintain a sense of dignity, agency, and hope despite financial hardship.

There is abundent literature examines the positive relationship between individual social capital and SWB, especially in Western contexts (e.g., Sarracino, 2010; Binder & Freytag, 2013; Rodríguez-Pose & Von Berlepsch, 2014; Arampatzi et al., 2018). However, the relationship between social capital and SWB in the Global South has received less attention (Schlossarek et al., 2024). Previous studies focusing on individual SSA countries found that social capital is significantly associated with decreased mental health problems, better psychological well-being (Hunduma et al., 2022; Kolade et al., 2022) and higher levels of life satisfaction (Christian et al., 2020; Imbulana Arachchi & Managi, 2023; Schlossarek et al., 2024). In this regard, social relations are considered especially important in the SSA context because they provide a valuable resource in an environment where the public services and assets are limited or difficult to access (Helliwell et al., 2020; Woldehanna et al., 2022; Heikkilä et al., 2016). Poor people often depend on the support of (extended) family relationships (Di Falco & Bulte, 2011), which not only offer material support but also psychological support.

Using the Gallup World Poll of 2022, which incorporates an additional module on social capital, we build upon the existing literature and examine whether social capital alleviates the effects of poverty in the SSA region. Furthermore, we differentiate between distinct forms of social capital, namely bonding and bridging. Following Granovetter (1973) and Putnam (2000), bonding social capital refers to strong ties, while bridging social capital refers to weak ties, each serving different functions. Bonding social capital promotes solidarity and immediate material and psychological

support, whereas bridging social capital offers access to broader opportunities, diverse information, and upward mobility. Similarly, Flap (2002) argues that social capital depends not only on the number of people willing to help or their willingness, but also on what lies 'on the other side of the tie'.

Given the above, this study addresses the following research questions: i) How is poverty associated with life evaluation and affect balance in SSA? ii) Do different forms of social capital, specifically, bonding (emotional support and ability to count on help), and bridging (social media use) moderate the poverty–SWB relationship? iii) Do different social connection tie types (family/friends, colleagues/classmates, neighbours, shared-interest groups, strangers) and their frequency of contact moderate the poverty–SWB relationship?

Our results show that individual-level social capital has a direct, positive association with SWB, regardless of income level. Noteably, certain types of bridging social capital (i.e., social media use and connections with colleagues) moderate the adverse effects of poverty, thereby enhancing affective well-being among individuals facing significant material hardship. Moreover, bonding social capital (i.e., connections with family and friends) only mitigates the effect of poverty on the evaluative component of SWB.

This study contributes to the existing discourse on social capital and SWB by: (i) distinguishing evaluative and affective SWB in an SSA-wide analysis, (ii) examining how social capital as a source of social support moderates the relationship between poverty and SWB, and (iii) separating between bonding and bridging social capital to determine which types of ties alleviate the effects of poverty.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework and reviews the literature on social capital, poverty, and subjective well-being in SSA. Section 3 outlines the data, selected variables, and methodology. The results are reported in Section 4, followed by the discussion and conclusion in Section 5.

2 Background

2.1 Subjective well-being and poverty

2.1.1 Subjective well-being

Subjective well-being (SWB) refers to people's cognitive and emotional evaluation of their lives (Diener, 1984; Diener et al., 1999) and has been defined as the “degree to which an individual judges the overall quality of his/her own life-as-a whole favourably” (Veenhoven, 1984, Chapter 2). According to Veenhoven (2000), people draw on two key sources when evaluating their SWB: their emotional states and their cognitive judgments. This means individuals assess how they generally feel and also compare their current life to both their ideal and worst imaginable scenarios. However, these emotional and cognitive aspects of well-being do not always align, as different life circumstances can influence them. For example, research by Diener et al. (2013) and Kahneman and Deaton (2010) indicates that national income levels tend to have a stronger relationship with cognitive evaluations than with emotional well-being. In contrast, emotional experiences are more closely associated with the satisfaction of psychological needs, such as receiving social support.

2.1.2 Income and SWB

At the individual level, income and SWB are positively correlated (Powdthavee, 2010; Graham et al., 2004; Blanchflower & Oswald, 2004). However, this relationship is stronger for individuals in poorer countries than for individuals in wealthier countries (Howell & Howell, 2008; Diener et al., 2003; Diener et al., 1993; Veenhoven, 1991; Camfield et al., 2010). This trend is also apparent at the national level when examining the link between GDP and SWB (Easterlin, 1974). This phenomenon can be explained by needs theory, which posits that income is most strongly related to SWB when individuals have the purchasing power to satisfy their basic needs (e.g., food, shelter, clothing, sanitation, etc.) (Howell & Howell, 2008; Diener & Biswas-Diener, 2002; Diener & Lucas, 2000; Møller & Schlemmer, 1983; Veenhoven, 1991). An inability or difficulties regarding satisfying basic needs can increase stress levels (Åslund et al., 2014; Park et al., 2017) and life satisfaction (Heo et al., 2020).

Individuals also have higher-order needs (e.g., belongingness, self-actualization, autonomy, personal security, etc.), which are non-material and therefore less likely to be fulfilled by monetary resources (Howell & Howell, 2008; Arthaud-Day & Near, 2005; Diener & Diener, 1995; Lever et al., 2005; Cummins, 2000; Oishi et al., 1999). Hence, as income increases, marginal utility with regard to SWB diminishes (Frey & Stutzer, 2002; Stevenson & Wolfers, 2008). Within the literature, some researchers argue that there is a saturation point, and when this point is reached, income does not increase happiness (Diener & Seligman, 2004; Clark et al., 2008; Di Tella & MacCulloch, 2008). Yet, others suggest that there is no saturation point (Deaton, 2008; Stevenson & Wolfers, 2008). Regardless, it can be expected that individuals who experience poverty are more likely to struggle to meet their basic needs and the association between poverty and SWB is strongly negative (Camfield et al., 2010; Diener & Biswas-Diener, 2002; Howell et al., 2006).

2.1.3 Poverty and SWB in Sub-Saharan Africa

SSA countries are considered to be developing countries, and a greater portion of the population in developing countries experiences poverty than in developed countries (Sachs, 2006). Within the literature, there is evidence that income is significantly and positively related to SWB at the individual level within SSA (Reyes-García et al., 2016; Cramm et al., 2010; Addai et al., 2014; Hinks & Gruen, 2007; Ibem & Amole, 2013; Mahadea & Rawat, 2008; Adesanya et al., 2017; Ngamaba, 2016; Daw et al., 2023; Kollamparambil & Ndlovu, 2023; Morton et al., 2018). Notably, a stable income is more beneficial for SWB than an unstable income (Blaauw et al., 2018). Similarly, the average income for SSA neighbourhoods also shows a positive relationship with SWB (Reyes-García et al., 2016; Kingdon & Knight, 2006; Cramm et al., 2012). To help assist individuals and households who experience poverty, several cash transfer and asset-building programs have been implemented. These programs have been shown to improve SWB by helping individuals and households meet their basic needs and inspiring hope for a better future (Kilburn et al., 2016; Alloush & Wu, 2023; Chipunza & Fanta, 2024; McGuire et al., 2022).

2.2 Social Capital

2.2.1 Social Capital

Social capital can be broadly defined as the networks, norms, and trust that facilitate coordination and cooperation (Putnam, 1995; 2000). However, its structure and effects are shaped by the nature of interpersonal ties. Following Portes (2000), social capital has both individual dimensions (e.g., relationships and reciprocity) and collective dimensions (e.g., trust and social cohesion). In this paper, we focus predominantly on the individual dimensions of social capital in general, with particular emphasis on social connections.

Granovetter's (1973) seminal theory on the "strength of weak ties" provides a foundational understanding of how different types of social connections function and should be interpreted. Granovetter (1973) argued that *weak ties*, those characterized by infrequent interaction and low emotional closeness, are particularly valuable because they connect disconnected social groups. This facilitates access to novel information, opportunities, and resources. In contrast, *strong ties*, such as those between close friends and family, promote emotional support and cohesion but often exist within dense, redundant networks.

Building on this, Putnam (2000) distinguishes between *bonding* and *bridging* social capital. *Bonding social capital* arises from strong, close-knit ties within homogeneous groups, such as family, close friends, or tightly bound communities. These ties are often ‘inward-looking’ and foster trust, solidarity, and mutual support among similar individuals or groups. Bonding social capital is especially important during times of crisis by providing emotional and material support that helps maintain group cohesion and survival.

Bridging social capital emerges from weak, more distant connections that are ‘outward-looking’. These ties link people across diverse social divides, such as different ethnicities, religions, or socioeconomic backgrounds. Connections with colleagues, neighbours and strangers are considered to be bridging social capital. Bridging social capital is essential for expanding opportunities, fostering a sense of shared identity, and enhancing the collective capacity for civic action (collective efficacy). By

connecting different groups, bridging social capital helps people access new information, resources, and opportunities that are unavailable within one closed group.

2.2.2 Moderating role of social capital on the relationship between poverty and SWB

Currently, extensive literature indicates that social capital influences subjective well-being through the provision of emotional and instrumental support, and by promoting trust and a sense of safety (e.g., Ram, 2010; Bartolini et al., 2013; Portela et al., 2013; Rodríguez-Pose & Von Berlepsch, 2014; Arampatzi et al., 2018; Helliwell et al., 2023).

Social capital can serve as a positive moderator by buffering individuals from the negative effects of stressful situations (Cohen & Wills, 1985). Putnam (2000) highlights how those in poverty often depend more heavily on informal social connections than their non-poor counterparts, making these networks a key driver of their SWB. Similarly, findings from Narayan-Parker and Patel (2000) underscore that the poor consistently cite social relationships as vital to their survival and dignity. Furthermore, financial support (e.g., remittances, microcredit, local savings, etc.) are crucial for helping impoverished people escape poverty, and social networks play a key role in securing financial support (Woldehanna et al., 2022; Heikkilä et al., 2016). Additionally, Woolcock (2001) argues that bonding and bridging social capital enable the poor not only to cope with adversity but also to enhance their life chances by providing access to opportunities that would otherwise remain inaccessible. However, a key challenge is that the poor often lack access to bridging social capital. In this regard, Schlossarek et al. (2024) find that in the poor region of Muoyo-Mukukutu in Zambia being member of a formal or informal groups significantly enhances SWB.

When examining the alleviating effects of social capital, the poor tend to benefit more from social capital than the non-poor. Bonding social capital offers support by 'holding hands' and can act as a substitute for missing economic resources and an informal support system. Bridging social capital creates opportunities by 'opening doors'. The material support that social capital can provide can help alleviate the stress individuals experience, thereby protecting their SWB (Park et al., 2017; Åslund et al., 2014). Most notably, social capital promotes economic coping. It can help struggling individuals to

satisfy their basic physical needs by directly providing resources or the means to obtain them (Carter & Maluccio, 2003; Mladovsky & Mossialoas, 2008). Along these lines, social capital can provide instrumental well-being by ensuring access to basic needs. This, in turn, affects the evaluative component of SWB, which is typically more strongly related to income than the affective component of SWB (Kahneman & Deaton, 2010; Burger & Arampatzi, 2025).

In addition to material support, social capital can also provide psychological support, which can help mitigate stress and increase resilience (Park et al., 2017; Kolade et al., 2022). In this regard, people turn to their family and friends not just for financial help, but also for belonging, empathy, and reassurance. In this regard, the psychological support that social capital can offer moderate the relationship between poverty and the affective component of SWB. In sum, both material and psychological support from one's social capital can help mitigate the negative association between poverty and SWB, where it can be expected that bonding social capital plays an important role.

In addition to material and psychological support, social capital yields disproportionately high returns for the poor because it can act as a strategic resource to overcome structural disadvantages. Through bridging social capital, poor people can gain access to information about job opportunities or education pathways otherwise closed to them (Woolcock, 2001). The quality of bridging social capital has been argued to be a key factor for reducing poverty (Zhang et al., 2017). Enhancing capabilities contributes to greater feelings of control, purpose, and hope, which in turn would positively affect SWB. In other words, bridging social capital can help the poor to prosper and provide hope by providing opportunities.

2.2.3 Adverse effects of social capital

Although social capital can help alleviate the negative effects of poverty, it may have adverse effects on SWB as well. First, relying on others or social institutions for financial assistance and support may generate negative affect (Weinstein & Stone, 2018; Pan et al., 2007). For example, individuals who claim welfare payments may experience this as being humiliating and shameful. Second, previous research found that support-seeking behaviours are not beneficial for reducing stress because talking

about problems that have no clear or easy solution is distressing (Meyer & Lobao, 2003; Hoyt et al., 1995; Coyne & Downey, 1991). Lastly, people who are part of an individual's social capital may also be impacted by financial hardship (e.g., spouse, dependent children), which can undermine the individual's need for relatedness and increase stress (Weinstein & Stone, 2018).

Previous research on social networks found that within impoverished communities, people who perceive that their social capital is not able to provide long-term support and feel that they are burdening others who are also struggling report increased negative affect (Brodsky, 1996). Accepting support may foster feelings of indebtedness to share emotional and material resources in the future, and failure to do so may evoke negative perceptions from the community (Brodsky, 1996; Goodman et al., 2010). In this regard, bonding social capital may help individuals meet their physical needs, but at the cost of their psychological needs, thereby hindering overall SWB.

While social capital can offer protective effects, these benefits are contingent rather than guaranteed (Cleaver, 2003). Using Tanzania as an example, Cleaver (2003) warned that the most destitute people may lack access to social capital due to limited networks, poor health, or social exclusion, limiting their capacity to use these resources to escape poverty. Sometimes, strong bonding social capital within disadvantaged groups can even perpetuate exclusion from broader opportunities because it hinders the creation of bridging social capital. Yet, even when there are programs designed to foster bonding social capital, practical barriers (e.g., time) may prevent people from participating in them and those who are not able to participate may be stigmatized by their community (Nichols, 2021). Some programs have a participation fee, which may exclude the ultra-poor and prevent them from accessing much needed bridging social capital (Narayan & Pritchett, 1999; Woolcock & Narayan, 2000). Regarding bonding social capital, Woldehanna et al., (2022) note that in some cultures, such as Ethiopia, there are steep financial costs involved in maintaining social networks (e.g., the cost of weddings), and some households even prioritise their social network over their economic security. Similarly, in SSA, kinship relationships create moral obligations for sharing and re-distributing wealth among family. This makes it

difficult for people to save financial resources and creates a 'culturally induced-poverty trap' (Di Falco & Bulte, 2011). In this situation, maintaining social capital hinders impoverished households from escaping poverty.

3 Data and Methodology

3.1 Data

To examine whether social capital moderates the relationship between poverty and SWB, we utilize data from the Gallup World Poll (GWP) for 2022. The GWP annually collects nationally representative samples of about 1,000 respondents from SSA countries. Although longer time series are available, in 2022, the GWP contained an additional module on social capital that allowed us to distinguish between bonding and bridging social capital. Overall, our baseline sample consists of 28,652 respondents who filled out the GWP in 32 SSA countries for all relevant questions.

3.2 Selection of Variables

3.2.1 SWB

Within the literature, there is consensus that SWB has a cognitive and affective component. Therefore, in this study, we investigate the relationship between social capital and both life evaluation and affect balance. To measure life evaluation, we use Cantril's ladder (Cantril, 1965), which is an evaluative well-being measure, asking respondents: *'Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time? 0 is the worst possible life, and 10 is the best possible life for you'*.

The affect balance is calculated as the difference between positive and negative affect. For positive affect, we rely on the Positive Experience Index, which is a measure of respondents' experienced well-being. Questions provide a measure of respondents' positive experiences about being well-rested, treated with respect, smiling or laughing a lot, doing something interesting and experiencing enjoyment. Negative affect is

sourced from the Negative Experience Index, which is compiled using respondents' negative experiences about worry, stress, anger, physical pain and sadness.

Index scores are calculated at the individual record level. The five items are recoded so that positive answers are scored as a "1" and all other answers (including don't know and refused) are scored as a "0." If a record has no answer for an item, then that item is not eligible for inclusion in the calculations. An individual record has an index calculated if it has at least four out of five valid scores (0 or 1). The record's final score is the mean of valid items multiplied by 100. In our analyses, we rescale the indices to a 0-10 index to facilitate comparison with the Cantril ladder.

3.2.2 Poverty

To measure poverty, we use the international poverty line, a global benchmark defined by the World Bank, to measure extreme poverty consistently across countries over time. Poverty is measured using a Boolean dummy variable that takes the value 1 when the average per capita income of a household is below the international poverty line of $2.15 per day (2017 PPP), which can be used as an indicator of extreme poverty. In our sensitivity analyses, we examine to what extent our results are robust across different definitions of poverty, where we apply country-specific poverty lines - $2.15 per day for low-income countries, $3.65 per day for lower-middle income countries, and $6.85 per day for upper-middle-income countries. A classification of countries can be found in Appendix A, Table A3.

3.2.3 Social Capital

In our research, we make use of several dimensions of social capital. We begin by examining the extent to which social support, a key function of bonding social capital, moderates the relationship between poverty and SWB. Emotional support was captured using the question: '*In general, how supported do you feel by people? By supported, I mean how much you feel cared for by people. Do you feel…?*' Answer categories were (1) Not at all supported, (2) Little supported, (3) Fairly supported, and (4) Very supported. Although the survey does not include a question explicitly measuring the extent of material support, we added a general question on social support, which also reflects material support: '*If you were in trouble, do you have*

relatives or friends you can count on to help you whenever you need them, or not?' Answer categories were (1) Yes and (2) No.

Unfortunately, the Gallup World Poll 2022 does not include specific questions regarding the function or purpose of bridging social capital in the context of poverty. Ideally, a variable measuring access to information and resources through weak ties would be available, such as a question measuring the frequency of discussing politics, jobs, or education with people from different backgrounds. Instead, we utilize a question on the use of social media, which generally has been considered to be of a bridging nature due to its expansive and low-barrier nature (Ellison et al., 2007; Ahmad et al., 2023), also in the African context (Johnston et al., 2013). Yet, it should be noted that social media can also support bonding social capital when used intentionally to maintain close relationships. To assess the effect of social media use, we utilize the question: '*Have you used any social media over the past 30 days?*' Answer categories were (1) Yes and (2) No.

Subsequently, we examined how the type and frequency of social contacts moderated the relationship between poverty and SWB, based on the question: '*How often did you interact with [….] in the past 7 days?*' *(1) Never, (2) Only once, (3) A few times, (4) Once per day or (5) More than once per day.*' Five different groups of social ties were examined: (1) friends or family who live near or far away[1], (2) people from work or school, (3) neighbours or people who live near you, (4) people from groups you are a part of based on shared interests, and (5) strangers or people you don't know. Appendix A, table A1 and A2 show that the correlations between the different social capital variables are only modest.

It should be noted that in the African context, bonding social capital can extend beyond the nuclear family, while bridging is often associational ties or related religious groups. Hence, based on our variables, contacts with family and friends represent the core of bonding social capital, characterized by strong emotional ties, shared identity, and dependable mutual support. Also, neighbours provide bonding social capital,

[1] Here, we take the maximum value of answers on two questions: (a) friends or family who live near and (b) family or friends who live far away.

especially in traditional communities, but can become sources of bridging social capital in more diverse urban environments. People from school or work provide primarily bridging social capital, particularly when they cross into diverse professional networks, which is more likely to happen in urban environments. People with shared interests foster bridging social capital, linking individuals from varied walks of life through common goals or values. Finally, strangers represent the weakest ties, which can be considered the purest form of bridging social capital. However, although strangers can act as gateways to new opportunities or information beyond one's social network, strangers do not or cannot automatically offer this.

3.2.4 Covariates

We control for several factors that potentially mitigate the relationships between poverty, social capital and SWB. Specifically, we control for age, gender, education level, location of residence, institutional trust and health status (see Appendix A). These variables are not only determinants of life satisfaction but also poverty and social capital. Country fixed effects are included to account for other cultural, institutional, and economic differences between countries. The choice of the covariates is based on the fact that we aim to account for sample structure and demographics, but not include variables that potentially mediate the relationship between poverty and SWB. In other words, we control for variables that are antecedents of poverty, social capital and SWB (Bartram et al., 2025).

3.3 Methodology

To examine the relationships between poverty, social capital and SWB, we specify a simple reduced-form SWB equation, which we estimate using Ordinary Least Squares:

$$SWB_{ij} = \theta Poverty_{ij} + \Omega Social\ Capital_{ij} + \Sigma Control_{ij} + \mu_j + \varepsilon_{it} \quad (1)$$

where SWB_{ij} is the reported Cantril ladder or affect balance score of individual *i* in country *j*, $Poverty_{ij}$ is a dummy variable indicating whether the household where the person is residing falls below the international poverty line. $Social\ Capital_{ij}$ is a vector

of individual social capital variables for individual *i* in country *j*, $Control_{ij}$ is a vector of the control variables for individual *i* in country *j*, μ_j are country fixed effects, and ε_{it} is the residual error.

To estimate the moderating effect of social capital on the relationship between poverty and SWB, we use moderation analysis (Hayes, 2018) and estimate the following model:

$$SWB_{ij} = \theta Poverty_{ij} + \Omega Social\ Capital_{ij} + \psi\left(\theta Poverty_{ij} \text{x}\ \Omega Social\ Capital_{ij}\right) + \Sigma Control_{ij} + \mu_j + \varepsilon_{it} \quad (2)$$

where $\theta Poverty_{ij} \text{x}\ \Omega Social\ Capital_{ij}$ now denotes the interaction effect between poverty and our social capital variables. By applying moderation analysis, we assess whether individuals with stronger social ties experience different well-being outcomes in the face of poverty. This approach allows us to evaluate the extent to which social capital buffers or amplifies the negative effects of poverty on life satisfaction for different dimensions of social capital.

4 Empirical Results

4.1 Descriptive Statistics

Table 1 shows the descriptive statistics for SWB and social capital measures for poor and non-poor people. The results show that poor people have lower social capital and SWB levels than non-poor people.

Table 1. Descriptive Statistics

	Poor people (n=21,667)		Non-poor people (n=6,985)	
Variable	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
Life evaluation	4.29	2.97	5.10	2.52
Affect balance	6.46	2.49	7.26	2.26
Emotional social support	2.98	0.86	3.13	0.94
Count on help	0.68	0.47	0.71	0.46

Social media use	0.45	0.50	0.72	0.45
Contacts family/friends	3.56	1.33	3.69	1.24
Contacts colleagues/classmates	2.73	1.50	3.21	1.48
Contacts neighbours	3.50	1.34	3.50	1.29
Contacts shared interest groups	2.78	1.38	2.95	1.34
Contacts strangers	2.27	1.31	2.47	1.36
N=28,652. All differences between groups are statistically significant, except for contacts with neighbours.				

4.2 Main Findings

Table 2 presents the OLS regression results examining the relationships between poverty, individual-level social capital (emotional support, count on help, social media use), and SWB, as measured by life evaluation (Cantril ladder) and affect balance. It also explores how these forms of social capital moderate the effect of poverty on SWB. We first report the main effects and then the moderating effects.

In terms of the main effects, we see from Table 2 that poverty is negatively associated with both life evaluation and affect balance. On average, being poor decreases SWB by about 0.3 points on both the Cantril ladder and the affect balance scale. Also, the three dimensions of social capital show consistent and significant positive associations with SWB.

However, while the effect of emotional social support has a stronger association with affect balance than with the Cantril ladder score, the opposite is true for social media use. These findings are in line with our expectations that social support, which is primarily obtained through bonding social capital, particularly affects the affective component of SWB, while bridging social capital (here in the form of social media) provides access to opportunities, which would predominantly affect the evaluative component of SWB.

Turning to the interaction effects, we find that counting on help (embodying both material and emotional support) positively moderates the relationship between poverty and affect balance, but not between poverty and the Cantril ladder score. Although counting on help has a positive effect on affect balance for both poor and non-poor people, this effect is considerably stronger for poor people. On the other hand, social media only shows a positive moderating effect on the relationship between poverty and the Cantril ladder. While there is no significant relationship between social media use and Cantril ladder for non-poor people, this relationship turns positive for poor people. We find no significant moderating effect of emotional support. However, when we exclude counting on help from our regressions (which covers both material and emotional support), the interaction effect between emotional support and poverty becomes weakly significant in the affect balance regression. These results are available upon request.

Table 2. OLS of the relationship between poverty, social capital and SWB

	Life evaluation					Affect balance				
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**
Poverty	-0.313***	-0.240**	-0.416***	-0.506***	-0.451***	-0.301***	-0.435***	-0.481***	-0.318***	-0.545***
	(0.040)	(0.120)	(0.078)	(0.069)	(0.135)	(0.033)	(0.103)	(0.069)	(0.055)	(0.115)
Emotional social support	0.177***	0.197***	0.177***	0.177***	0.216***	0.384***	0.347***	0.384***	0.384***	0.363***
	(0.018)	(0.034)	(0.018)	(0.018)	(0.034)	(0.014)	(0.029)	(0.014)	(0.014)	(0.030)
Count on help	0.740***	0.740***	0.628***	0.738***	0.643***	0.811***	0.810***	0.618***	0.811***	0.627***
	(0.038)	(0.038)	(0.078)	(0.038)	(0.079)	(0.032)	(0.032)	(0.069)	(0.032)	(0.071)
Social media use	0.335***	0.335***	0.335***	0.103	0.106	0.149***	0.148***	0.149***	0.128**	0.153***
	(0.038)	(0.038)	(0.038)	(0.071)	(0.071)	(0.030)	(0.030)	(0.030)	(0.059)	(0.059)
Poverty*Em. social support		-0.025			-0.049		0.046			0.026
		(0.039)			(0.039)		(0.032)			(0.033)
Poverty*Count on help			0.136		0.118			**0.237*** **		**0.225*** **
			(0.087)		(0.089)			**(0.076)**		**(0.078)**
Poverty*Social media use				**0.294*** **	**0.290*** **				0.026	-0.005
				(0.079)	**(0.080)**				(0.065)	(0.066)
Observations	28,652	28,652	28,652	28,652	28,652	28,652	28,652	28,652	28,652	28,652
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10.

Next, we turn to Table 3 for the results pertaining to how different types of social ties, categorized as bonding (e.g., family, neighbours) and bridging (e.g., colleagues, strangers), are related to SWB and whether they moderate the relationship between poverty and SWB.

We see in Table 3 that poverty is again negatively associated with both life evaluation and affect balance. Across different types of social ties, more frequent contact with family/friends, colleagues/classmates, and members of shared-interest groups is positively associated with both outcomes. Neighbour contact is negatively related to life evaluation but positively to affect balance, which suggests that such ties may offer emotional support without necessarily improving life evaluation. Contact with strangers shows no association with life evaluation and is associated with lower affect balance.

Table 3. OLS of the relationship between poverty, type of social connection and SWB

Variable	Model 1 (Cantril Ladder)	Model 2 (Cantril Ladder	Model 3 (Affect Balance)	Model 4 (Affect Balance)
Poverty	-0.408***	-0.572***	-0.419***	-0.481***
	(0.040)	(0.142)	(0.034)	(0.114)
Contacts family/friends nearby	0.101***	0.043	0.112***	0.138***
	(0.015)	(0.028)	(0.013)	(0.024)
Contacts colleagues/classmates	0.065***	0.014	0.067***	0.031
	(0.012)	(0.023)	(0.010)	(0.019)
Contacts neighbours	-0.072***	-0.026	0.037***	0.068***
	(0.014)	(0.026)	(0.012)	(0.022)
Contacts shared interest groups	0.027**	0.049**	0.044***	0.040*
	(0.013)	(0.024)	(0.011)	(0.021)
Contacts strangers	0.008	-0.004	-0.048***	-0.093***
	(0.013)	(0.023)	(0.011)	(0.020)
Poverty * Contact family/friends		**0.076****		-0.035
		(0.033)		(0.028)
Poverty * Contact colleagues		**0.067****		**0.047****

		(0.026)		**(0.022)**
Poverty * Contact neighbours		**-0.061****		-0.041
		(0.030)		(0.026)
Poverty * Contact shared int. gr.		-0.028		0.005
		(0.029)		(0.025)
Poverty * Contact strangers		0.016		**0.061****
		(0.028)		**(0.024)**
Observations	28,652	28,652	28,652	28,652
Control variables	YES	YES	YES	YES

Robust standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10.

Turning to the interaction effects, we find that contact with family/friends positively moderates the relationship between poverty and life evaluation, but not affect balance. Contact with colleagues/classmates shows a stronger positive association for poor people across both SWB measures. This suggests that bridging ties to work or school networks provide benefits, likely through access to opportunities and information. In contrast, neighbour contact has a negative moderating effect on life evaluation. Possibly this implies that in poor settings, frequent contact with neighbours might intensify the perceived burden of poverty, due to social perceived reciprocal obligation or collective hardship. Contact with strangers has no significant moderating effect on life evaluation but shows a positive moderation for affect balance, slightly reducing the gap between poor and non-poor individuals. Contacts with shared-interest groups show no significant moderating effects.

4.3 Sensitivity analysis

4.3.1 Alternative measures of social capital

We start by examining the different functions of social capital: feelings of connectedness, i.e., belonging and loneliness. Social belonging is captured using the question: *'In general, how connected do you feel to people? By connected, I mean how close you feel to people emotionally. Do you feel…?'* Answer categories were (1) Not at all connected, (2) Little connected, (3) Fairly connected, and (4) Very connected. The degree of experienced loneliness was measured using the question: *'In general, how lonely do you feel? By lonely, I mean how much you feel emotionally isolated from people.*

Do you feel…?' Answer categories were (1) Not at all lonely, (2) A little lonely, (3) Fairly lonely, and (4) Very lonely.

From Table 4, we see that although loneliness and social connectedness are important for SWB, they do not moderate the relationship between poverty and SWB. This was also theoretically not expected.

Table 4. OLS of the relationship between poverty, alternative types of social capital and SWB

Variable	Model 1 (Cantril Ladder)	Model 2 (Cantril Ladder)	Model 3 (Affect Balance)	Model 4 (Affect Balance)	Model 5 (Affect Balance)	Model 6 (Affect Balance)
Poverty	-0.309***	-0.176	-0.362*	-0.286***	-0.356***	-0.624***
	(0.040)	(0.163)	(0.190)	(0.033)	(0.134)	(0.158)
Emotional social support	0.170***	0.170***	0.199***	0.306***	0.306***	0.265***
	(0.019)	(0.019)	(0.037)	(0.015)	(0.015)	(0.031)
Count on help	0.731***	0.731***	0.631***	0.775***	0.775***	0.567***
	(0.038)	(0.038)	(0.079)	(0.032)	(0.032)	(0.070)
Social media use	0.334***	0.335***	0.102	0.140***	0.139***	0.128**
	(0.038)	(0.038)	(0.071)	(0.030)	(0.030)	(0.059)
Social connectedness	0.008	0.031	0.031	0.206***	0.208***	0.235***
	(0.020)	(0.037)	(0.039)	(0.016)	(0.031)	(0.033)
Loneliness	-0.071***	-0.054*	-0.058*	-0.205***	-0.233***	-0.242***
	(0.017)	(0.031)	(0.031)	(0.013)	(0.026)	(0.026)
Poverty*Em. social support			-0.038			0.052
			(0.042)			(0.035)
Poverty*Count on help			0.122			**0.254*** **
			(0.089)			**(0.078)**
Poverty*Social media use			**0.295*** **			0.014
			(0.080)			(0.065)
Poverty*Social conn.		-0.029	-0.029		-0.002	-0.036
		(0.042)	(0.046)		(0.035)	(0.038)
Poverty*Loneliness		-0.021	-0.017		0.036	0.047
		(0.036)	(0.036)		(0.030)	(0.030)
Observations	28,652	28,652	28,652	28,652	28,652	28,652

Control variables	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10.

4.3.2 Social Capital in urban and rural environments

We sought to determine whether urban environments have a stronger moderating effect of social media use and ties to colleagues in cities, given that urban environments provide more opportunities, and some forms of social capital are more of a bridging nature. From Table 5, we see that while there is no relationship between social media use and life evaluation for non-poor people in urban centres, this relationship turns positive for poor people. We find no moderating effect of emotional support, while counting on help positively moderates the relationship between poverty and affect balance in urban centres.

Table 5. OLS of the relationship between poverty, social capital and SWB in urban vs rural areas

Variable	Model 1 (Rural areas) (Cantril Ladder)	Model 2 (Towns and cities) (Cantril Ladder)	Model 3 (Rural areas) (Affect Balance)	Model 4 (Towns and cities) (Affect Balance)
Poverty	-0.424	-0.496***	-0.420*	-0.579***
	(0.265)	(0.159)	(0.221)	(0.137)
Emotional social support	0.218***	0.219***	0.384***	0.358***
	(0.073)	(0.039)	(0.062)	(0.034)
Count on help	0.417**	0.735***	0.583***	0.645***
	(0.165)	(0.089)	(0.141)	(0.082)
Social media use	0.181	0.106	0.178	0.147**
	(0.144)	(0.082)	(0.121)	(0.068)
Poverty*Em. social support	-0.127	-0.007	-0.037	0.059
	(0.079)	(0.046)	(0.066)	(0.039)
Poverty*Count on help	0.218	0.115	0.178	0.165*
	(0.177)	(0.103)	(0.121)	(0.093)
Poverty*Social media use	0.115	0.316***	0.009	-0.029
	(0.155)	(0.095)	(0.129)	(0.078)
Observations	28,652	28,652	28,652	28,652
Control variables	YES	YES	YES	YES

Robust standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10.

In terms of the type of social connections, we see from Table 6 that bonding connections with family/friends positively moderates life evaluation for the rural poor, while bridging connections with colleagues/classmates positively moderates urban poor respondents' life evaluation and affect balance. By contrast, neighbour contact negatively moderates the relationship with poor urban respondents compared to the non-poor, and contact with strangers, though generally negative for affect, becomes less negative for the poor in both settings. Altogether, these results suggest that the role of social capital is context-dependent. Bridging ties are particularly important in urban environments, while certain bonding ties matter more in rural contexts.

Table 6. OLS of the relationship between poverty, type of social connections and SWB in urban vs rural areas

Variable	Model 1 (Rural areas) (Cantril Ladder)	Model 2 (Towns and cities) (Cantril Ladder)	Model 3 (Rural areas) (Affect Balance)	Model 4 (Towns and cities) (Affect Balance)
Poverty	-0.723**	-0.529***	-0.481**	-0.482***
	(0.292)	(0.165)	(0.219)	(0.135)
Contacts family/friends	-0.060	0.067**	0.147***	0.134***
	(0.062)	(0.032)	(0.049)	(0.028)
Contacts colleagues/classmates	0.051	0.004	0.089**	0.015
	(0.047)	(0.026)	(0.040)	(0.022)
Contacts neighbours	-0.029	-0.026	0.046	0.073***
	(0.057)	(0.029)	(0.045)	(0.026)
Contacts shared interest groups	0.076	0.044	0.029	0.046*
	(0.056)	(0.027)	(0.048)	(0.024)
Contacts strangers	0.029	-0.013	-0.120***	-0.085***
	(0.052)	(0.026)	(0.044)	(0.023)
Poverty * Contact family/friends	**0.174****	0.048	-0.053	-0.030
	(0.068)	(0.039)	(0.054)	(0.034)
Poverty * Contact colleagues	0.011	**0.081*****	-0.035	**0.079*****
	(0.052)	**(0.031)**	(0.044)	**(0.026)**
Poverty * Contact neighbours	-0.064	-0.057	-0.001	**-0.058***
	(0.062)	(0.036)	(0.049)	**(0.031)**
Poverty * Contact shared int.	-0.067	-0.017	0.032	-0.006

gr.				
	(0.061)	(0.034)	(0.052)	(0.029)
Poverty * Contact strangers	-0.002	0.015	0.101**	0.050*
	(0.058)	(0.033)	(0.049)	(0.028)
Observations	28,652	28,652	28,652	28,652
Control variables	YES	YES	YES	YES

Robust standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10.

5 Discussion and Conclusion

This study examines how individual forms of social capital are associated with subjective well-being (SWB) in Sub-Saharan Africa (SSA) and whether they moderate the relationship between poverty and SWB. Drawing on data from nearly 29,000 individuals across 32 countries, the findings provide strong evidence that social capital is not only independently associated with higher life evaluation and affective well-being, but can also offer important protective benefits by moderating the negative effects of poverty on SWB.

First, our results confirm prior literature (e.g., Powdthavee, 2010; Graham et al., 2004; Blanchflower & Oswald, 2004) that poverty is negatively associated with life evaluation and affect balance, which reinforces the importance of material sufficiency for meeting basic human needs. This is also aligned with needs theory, which suggests that income fosters SWB when it allows people to fulfill their basic needs (Howell & Howell, 2008; Diener & Biswas-Diener, 2002; Diener & Lucas, 2000; Møller & Schlemmer, 1983; Veenhoven, 1991). Additionally, we find strong evidence that emotional support, the ability to count on help, and social media use are positively associated with SWB. This finding is aligned with previous research on social capital and SWB, which posits that social capital is a resource that facilitates subjective well-being (e.g., Bartolini et al., 2013; Rodríguez-Pose & Von Berlepsch, 2014; Arampatzi et al., 2018; Piao et al., 2022; Adedeji et al., 2023; Helliwell et al., 2023).

Considering social capital as a moderator, the results are heterogeneous across social capital dimensions and the SWB component. First, the ability to count on help moderates the relationship between poverty and affect balance, but not life evaluation,

indicating a differential association across SWB dimensions. This finding is aligned with previous research that argues that social capital, such as family and friends, provides psychological support, which helps foster resilience and reduce stress (Park et al., 2017; Kolade et al., 2022). Yet, this result did not find evidence for a stress buffering effect from material support, which was suggested by other research (Park et al., 2017; Åslund et al., 2014). It is possible that material support provided in impoverished areas by community members is short-term, thus the stress of procuring material resources is not fully alleviated (Brodsky, 1996). Second, social media use moderates the relationship between poverty and life evaluation, but not affect balance, which is consistent with a channel that relates more to information and opportunities than to affect. This is aligned with previous research that argued that social capital is crucial, especially for the poor, for assisting people with possibilities to overcome structural disadvantages they may encounter, thus providing them with more contral over their situation (Woolcock, 2001; Zhang et al., 2017) and that social media helps maintain bridging social capital (Ellison et al., 2014; Ahmad et al., 2023). Lastly, emotional support does not show a moderating association in the full models. This result suggests that while emotional support has a direct effect with SWB, it does not act as a buffer. It is possible that emotional support fosters subjective well-being in general, but does not protect people from stress. This is aligned with Cohen & Wills' (1985) argument that some types of support improve baseline subjective well-being, and others act as buffers. Overall, these results show that some types of social capital buffer poor people from the negative influence of poverty on SWB, but the buffering effect depends on the type of social capital and dimension of SWB.

The differential effects of various types of social connections underscore Flap's (2002) argument that what matters in social capital is not just the presence of ties, but what is on the other side of the tie in terms of resources and opportunities. The findings from this paper highlight the distinction between bonding and bridging social capital. First, the frequency of contact with family/friends (i.e., bonding social capital) is positively associated with SWB. This is aligned with previous work that identifies bonding social capital as a resource for helping people cope (Putnam, 2000; Park et al., 2017; Kolade et al., 2022). In the moderation models, the results show that contact

with family/friends moderates the relationship between poverty and life evaluation, but not affect balance. Regarding bridging social capital, the frequency of contact with colleagues/classmates and shared-interest groups also moderates the relationship between poverty and both life evaluations and affect balance, which is aligned with previous research (Narayan-Parker, & Patel, 2000; Helliwell et al., 2020). These findings provide evidence for the positive benefits of social capital (i.e, access to opportunities and resources). Furthermore, neighbour contact shows mixed associations and contact with strangers is negatively associated with affect balance. This finding highlights the possible dark side of social capital. Specifically that relying on others may generate feeling of shame or guilt (Weinstein & Stone, 2018; Pan et al., 2007). It is possible that these negative feelings are more prominent for bridging social capital as it has less trust and reciprocity compared to bonding social capital. However, additional research is require to confirm this.

Although the results for the relationship between poverty, social capital and poverty are robust, it is paramount to consider the context in which they operate. In urban areas (i.e., towns and cities) social media use moderates the relationship between poverty and life evaluation. Moreover, the ability to count on help moderates the association between poverty and affect balance. These findings highlight that bridging opportunities are more salient in urban areas. Similarly, contact with colleagues and classmates buffers the influence of poverty on both life evaluation and affect balance. Neighbour contact and contact with strangers show more mixed patterns. These findings align with prior work suggesting that urban environments have offer bridging social capital through schools, workplaces, and diverse networks, which can enhance both evaluative and affective well-being (Lannoo et al., 2012; Granovetter, 1973).

In rural areas, the moderation patterns are generally weaker, with the exception that contact with family/friends moderates the relationship between poverty and life evaluation. This pattern reflects the idea that in rural contexts, where bridging opportunities are limited, bonding social capital plays a more critical role in supporting life evaluations by providing emotional support, trust, and resources (Putnam, 2000; Park et al., 2017). Overall, these results underscore that the protective function of

social capital is context-dependent, with bridging ties being most effective in urban environments and bonding ties being particularly relevant in rural settings, consistent with Cleaver's (2003) observation that the benefits of social capital are shaped by structural opportunities and constraints.

These findings suggest that interventions aiming to improve subjective well-being among people living in poverty should focus on facilitating access to bridging opportunities while maintaining dependable support networks, as this approach corresponds to the specific patterns we observed. First, interventions should focus on enhancing bridging opportunities in settings where their moderating effects are evident. For example, in urban areas, links to colleagues, classmates, and social media correspond to higher life evaluation and affective well-being for the poor. Practical measures could include facilitating job-placement partnerships with firms and schools, apprenticeships, alumni and mentor networks, and providing affordable connectivity solutions—such as public Wi-Fi or subsidized devices and data—together with foundational digital skills. Second, interventions should aim to enhance reliable support in settings where it has a moderating effect. For instance, in cities, the capacity to count on assistance moderates affective well-being. Relevant measures include mutual-aid schemes that are not restricted by neighbourhood, community savings groups, and referral systems that supplement cash transfers with short-term support. Third, context-specific tailoring is essential. For rural areas, interventions could focus on instruments that help maintain kinship connections, such as transport and communication support. In urban areas, programs should be cautious about emphasizing reciprocal obligations within local neighbourhoods, as neighbour contact exhibits weaker or potentially adverse moderating effects.

Although our study offers important contributions regarding the influence of social capital on subjective well-being among individuals living in poverty in SSA,, several limitations should be acknowledged. First, the analysis relies on cross-sectional data from the 2022 Gallup World Poll, which limits our ability to draw causal conclusions. Although we observe significant associations between poverty, social capital, and SWB, we cannot determine the direction of causality. Second, while we make a valuable

distinction between bonding and bridging social capital, our measures used are imperfect proxies. Lastly, despite controlling for key demographic and socioeconomic variables (e.g., age, education, health), there remains a possibility of unobserved heterogeneity.

References

Addai, I., Opoku-Agyeman, C., & Amanfu, S. K. (2014). Exploring predictors of subjective well-being in Ghana: A micro-level study. *Journal of Happiness Studies*, *15*, 869-890.

Adedeji, A., Olawa, B. D., Hanft-Robert, S., Olonisakin, T. T., Akintunde, T. Y., Buchcik, J., & Boehnke, K. (2023). Examining the pathways from general trust through social connectedness to subjective wellbeing. *Applied Research in Quality of Life*, *18*(5), 2619-2638.

Adesanya, A., O., Rojas, B. M., Darboe, A., & Beogo, I. (2017). Socioeconomic differential in self-assessment of health and happiness in 5 African countries: Findings from World Value Survey. *PloS one*, *12*(11), e0188281.

Ahmad, Z., Soroya, S. H., & Mahmood, K. (2023). Bridging social capital through the use of social networking sites: A systematic literature review. *Journal of Human Behavior in the Social Environment*, *33*(4), 473-489.

Alloush, M., & Wu, S. (2023). Income improves subjective well-being: Evidence from South Africa. *Economic Development and Cultural Change*, *71*(2), 485-517.

Arampatzi, E., Burger, M. J., & Novik, N. (2018). Social network sites, individual social capital and happiness. *Journal of Happiness Studies*, *19*(1), 99-122.

Arthaud-Day, M. L., & Near, J. P. (2005). The wealth of nations and the happiness of nations: Why "accounting" matters. *Social Indicators Research*, *74*, 511-548.

Åslund, C., Larm, P., Starrin, B., & Nilsson, K. W. (2014). The buffering effect of tangible social support on financial stress: influence on psychological well-being and psychosomatic symptoms in a large sample of the adult general population. *International Journal for Equity in Health*, *13*, 1-9.

Bartolini, S., Bilancini, E., & Pugno, M. (2013). Did the decline in social connections depress Americans' happiness? *Social Indicators Research*, *110*, 1033-1059.

Bartram, D. (2025). Does inequality undermine life satisfaction? Effective identification of country-level controls for a longitudinal investigation. *European Sociological Review*, jcaf014.

Binder, M., & Freytag, A. (2013). Volunteering, subjective well-being and public policy. *Journal of Economic Psychology*, *34*, 97-119.

Biswas-Diener, R., & Diener, E. D. (2006). The subjective well-being of the homeless, and lessons for happiness. *Social Indicators Research*, *76*(2), 185-205.

Blaauw, P. F., Botha, I., & Schenck, C. (2018). The subjective well-being of day labourers in South Africa: The role of income and geographical location. *South African Journal of Economic and Management Sciences*, *21*(1), 1-11.

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, *88*(7-8), 1359-1386.

Brodsky, A. E. (1996). Resilient single mothers in risky neighborhoods: Negative psychological sense of community. *Journal of Community Psychology*, *24*(4), 347-363.

Burger, M. J., & Arampatzi, E. (2025). Vision 2030 and Subjective Well-Being in Saudi Arabia. *Sustainability*, *17*(15), 6856.

Camfield, L., Guillen-Royo, M., & Velazco, J. (2010). Does needs satisfaction matter for psychological and subjective wellbeing in developing countries: A mixed-methods illustration from Bangladesh and Thailand. *Journal of Happiness Studies*, *11*, 497-516.

Carter, M. R., & Maluccio, J. A. (2003). Social capital and coping with economic shocks: an analysis of stunting of South African children. *World Development*, *31*(7), 1147-1163.

Chipunza, K. J., & Fanta, A. B. (2024). Asset accumulation, financial inclusion and subjective well-being: The role of financial formality in South Africa's households. *Review of Development Economics*, *28*(1), 128-150.

Christian, A. K., Sanuade, O. A., Okyere, M. A., & Adjaye-Gbewonyo, K. (2020). Social capital is associated with improved subjective well-being of older adults with chronic non-communicable diseases in six low- and middle-income countries. *Globalization and Health, 16*(1), 2.

Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature, 46*(1), 95–144.

Cleaver, F. (2003). The inequality of social capital: agency, association and the reproduction of chronic poverty presented at Staying Poor: Chronic Poverty and Development Policy, Institute for Development Policy and Management, University of Manchester, 7-9 April 2003. Chronic Poverty Research Centre (CPRC), Manchester, UK, 21 pp.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357.

Coyne, J. C., & Downey, G. (1991). Social factors and psychopathology: stress, social support, and coping processes. *Annual Review of Psychology, 42*, 401-425

Cramm, J. M., Møller, V., & Nieboer, A. P. (2010). Improving subjective well-being of the poor in the Eastern Cape. *Journal of Health Psychology*, *15*(7), 1012-1019.

Cramm, J. M., Møller, V., & Nieboer, A. P. (2012). Individual-and neighbourhood-level indicators of subjective well-being in a small and poor Eastern Cape township: The effect of health, social capital, marital status, and income. *Social Indicators Research*, *105*, 581-593.

Cummins, R. A. (2000). Personal income and subjective well-being: A review. *Journal of Happiness Studies, 1*(2), 133-158.

Daw, T. M., Reid, N. J., Coulthard, S., Chaigneau, T., António, V. M., Cheupe, C., ... & Bueno, E. (2023). Life satisfaction in coastal Kenya and Mozambique reflects culture,

gendered relationships and security of basic needs: Implications for ecosystem services. *Ecosystem Services*, *62*, 101532.

Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the Gallup World Poll. *Journal of Economic Perspectives*, *22*(2), 53-72.

Di Falco, S., & Bulte, E. (2011). A dark side of social capital? Kinship, consumption, and savings. *Journal of Development Studies*, *47*(8), 1128-1151.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research*, *57*, 119-169.

Diener, E. D., & Diener, C. (1995). The wealth of nations revisited: Income and quality of life. *Social Indicators Research*, *36*, 275-286.

Diener, E., & Lucas, R. E. (2000). Explaining differences in societal levels of happiness: Relative standards, need fulfillment, culture, and evaluation theory. *Journal of Happiness Studies*, *1*, 41-78.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, *54*(1), 403-425.

Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research*, *28*, 195-223.

Diener, E., & Seligman, M. E. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest*, *5*(1), 1-31.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*(2), 276.

Diener, E., Tay, L., & Oishi, S. (2013). Rising income and the subjective well-being of nations. *Journal of personality and social psychology, 104*(2), 267.

Diener, E. (1984). Subjective well-being. *Psychological bulletin*, *95*(3), 542.

Di Tella, R., & MacCulloch, R. (2008). Gross national happiness as an answer to the Easterlin Paradox? *Journal of Development Economics*, *86*(1), 22-42.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In P. A. David & M. W. Reder (Eds.), *Nations and households in economic growth: Essays in honor of Moses Abramovitz* (pp. 89–125). Academic Press.

Ellison, N. B., Vitak, J., Gray, R., & Lampe, C. (2014). Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes. *Journal of computer-mediated communication*, *19*(4), 855-870.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of computer-mediated communication*, *12*(4), 1143-1168.

Flap, H. (2002). Chapter 1: No man is an island: the research programme of a social capital theory: Markets, Networks and Hierarchies. In Conventions and Structures in Economic Organization. Cheltenham, UK: Edward Elgar Publishing.

Frey, B. S., & Stutzer, A. (2002). *Happiness and economics: How the economy and institutions affect well-being*. Princeton University Press.

Goodman, L. A., Smyth, K. F., & Banyard, V. (2010). Beyond the 50-minute hour: increasing control, choice, and connections in the lives of low-income women. *American Journal of Orthopsychiatry*, *80*(1), 3.

Graham, C. (2009). *Happiness around the world: The paradox of happy peasants and miserable millionaires*. Oxford University Press.

Graham, C., Eggers, A., & Sukhtankar, S. (2004). *Does happiness pay? An exploration based on panel data from Russia* (pp. 179-204). Springer Netherlands.Hayes, A. F. (2018). Introduction to mediation, moderation, and conditional process analysis: a regression-based approach (2nd ed.). New York: Guilford Press.

Heikkilä, A., Kalmi, P., & Ruuskanen, O. P. (2016). Social capital and access to credit: Evidence from Uganda. *The Journal of Development Studies*, *52*(9), 1273-1288.

Helliwell, J. F., Layard, R., Sachs, J. D., De Neve, J.-E., Aknin, L. B., & Wang, S. (Eds.). (2025). *World Happiness Report 2025*. University of Oxford: Wellbeing Research Centre.

Helliwell, J. F., Huang, H., Norton, M., Goff, L., & Wang, S. (2023). World happiness, trust and social connections in times of crisis. *World happiness report*, *2023*. University of Oxford: Wellbeing Research Centre.

Helliwell, J. F., Huang, H., Wang, S., & Norton, M. (2020, March). *Statistical appendix for chapter 2 of World Happiness Report 2020*. University of Oxford: Wellbeing Research Centre.

Heo, W., Lee, J. M., & Park, N. (2020). Financial-related psychological factors affect life satisfaction of farmers. *Journal of Rural Studies*, *80*, 185-194.

Hinks, T., & Gruen, C. (2007). What is the structure of South African happiness equations? Evidence from quality of life surveys. *Social Indicators Research*, *82*, 311-336.

Howell, C. J., Howell, R. T., & Schwabe, K. A. (2006). Does wealth enhance life satisfaction for people who are materially deprived? Exploring the association among the Orang Asli of Peninsular Malaysia. *Social Indicators Research*, *76*, 499-524.

Howell, R. T., & Howell, C. J. (2008). The relation of economic status to subjective well-being in developing countries: a meta-analysis. *Psychological bulletin*, *134*(4), 536.

Hoyt, D. R., O'Donnell, D., & Mack, K. Y. (1995). Psychological distress and size of place: The epidemiology of rural economic stress. *Rural Sociology*, *60*(4), 707-720.

Hunduma, G., Deyessa, N., Dessie, Y., Geda, B., & Yadeta, T. A. (2022). High Social Capital is Associated with Decreased Mental Health Problems Among In-School

Adolescents in Eastern Ethiopia: A Cross-Sectional Study. *Psychology Research and Behavior Management, 15*, 503.

Ibem, E. O., & Amole, D. (2013). Subjective life satisfaction in public housing in urban areas of Ogun State, Nigeria. *Cities*, *35*, 51-61.

Imbulana Arachchi, J., & Managi, S. (2023). The role of social capital in subjective quality of life. *Humanities and Social Sciences Communications, 10*(1), 1-10.

International Monetary Fund (IMF). (2025). Regional economic outlook. Sub-Saharan Africa: recovery interrupted. Washington, DC: International Monetary Fund. Available from https://www.imf.org/en/Publications/REO/SSA/Issues/2025/04/25/regional-economic-outlook-for-sub-saharan-africa-april-2025

Johnston, K., Tanner, M., Lalla, N., & Kawalski, D. (2013). Social capital: the benefit of Facebook 'friends'. *Behaviour & Information Technology*, *32*(1), 24-36.

Kilburn, K., Handa, S., Angeles, G., Mvula, P., & Tsoka, M. (2016). Happiness and Alleviation of Income Poverty: Impacts of an unconditional cash transfer programme using a subjective well-being approach.

Kingdon, G., & Knight, J. (2006). Subjective well-being poverty vs. income poverty and capabilities poverty? *The Journal of Development Studies, 42*(7), 1199–1224.

Kolade, O., Smith, R., Obembe, D., Taiwo, A., Eyong, J., James, S., & Kibreab, G. (2022). Picking up the pieces: social capital, psycho-social support and livelihood recovery of displaced populations in northeast Nigeria. *The Journal of Development Studies*, *58*(6), 1280-1299.

Kollamparambil, U., & Ndlovu, M. (2023). Assessing the income and subjective wellbeing relationship across sub-national developmental contexts. *Journal of Happiness Studies*, *24*(2), 769-790.

Lannoo, S., Verhaeghe, P. P., Vandeputte, B., & Devos, C. (2012). Differences in social capital between urban and rural environments. *Journal of Urban Affairs*, *34*(4), 373-394.

Lever, J. P., Pinol, N. L., & Uralde, J. H. (2005). Poverty, psychological resources and subjective well-being. *Social Indicators Research*, *73*, 375-408.

Mack, J., & Lansley, S. (1985). *Poor Britain*. London: G. Allen & Unwin.

Mahadea, D., & Rawat, T. (2008). Economic growth, income and happiness: An exploratory study. *South African Journal of Economics*, *76*(2), 276-290.

McGuire, J., Kaiser, C., & Bach-Mortensen, A. M. (2022). A systematic review and meta-analysis of the impact of cash transfers on subjective well-being and mental health in low-and middle-income countries. *Nature Human Behaviour*, *6*(3), 359-370.

Meyer, K., & Lobao, L. (2003). Economic hardship, religion and mental health during the midwestern farm crisis. *Journal of Rural Studies*, *19*(2), 139-155.

Mladovsky, P., & Mossialos, E. (2008). A conceptual framework for community-based health insurance in low-income countries: social capital and economic development. *World Development, 36*(4), 590-607.

Møller, V., & Schlemmer, L. (1983). Quality of life in South Africa: Towards an instrument for the assessment of quality of life and basic needs. *Social Indicators Research*, *12*, 225-279.

Morton, D., van Rooyen, D., Venter, D., & Andersson, L. (2018). Social determinants of subjective well-being among young adults living in the Eastern Cape, South Africa. *Journal of Psychology in Africa*, *28*(4), 284-290.

Narayan, D. (2002). Bonds and bridges: social capital and poverty. *Social capital and economic development: well-being in developing countries. Northampton, MA: Edward Elgar*, 58-81.

Narayan-Parker, D., & Patel, R. (2000). *Voices of the poor: Can anyone hear us?* (Vol. 1). World Bank Publications.

Narayan, D., & Pritchett, L. (1999). Cents and sociability: Household income and social capital in rural Tanzania. *Economic Development and Cultural Change*, *47*(4), 871-897.

Ngamaba, K. H. (2016). Happiness and life satisfaction in Rwanda. *Journal of Psychology in Africa*, *26*(5), 407-414.

Nichols, C. (2021). Self-help groups as platforms for development: The role of social capital. *World Development*, *146*, 105575.

OECD. (2001). The evidence on social capital. In *The well-being of nations: The role of human and social capital* (pp. 39–63). OECD Publishing.

Oishi, S., Diener, E. F., Lucas, R. E., & Suh, E. M. (1999). Cross-cultural variations in predictors of life satisfaction: Perspectives from needs and values. *Personality and Social Psychology Bulletin*, *25*(8), 980-990.

Pan, A. W., Chung, L., Fife, B. L., & Hsiung, P. C. (2007). Evaluation of the psychometrics of the Social Impact Scale: a measure of stigmatization. *International Journal of Rehabilitation Research*, *30*(3), 235-238.

Park, N., Heo, W., Ruiz-Menjivar, J., & Grable, J. E. (2017). Financial hardship, social support, and perceived stress. *Journal of Financial Counseling & Planning*, *28*(2).

Piao, X., Ma, X., Tsurumi, T., & Managi, S. (2022). Social capital, negative event, life satisfaction and sustainable community: Evidence from 37 countries. *Applied Research in Quality of Life*, *17*(3), 1311-1330.

Portes, A. (2000). The Two Meanings of Social Capital. *Sociological Forum, 15*(1), 1-12.

Powdthavee, N. (2010). How much does money really matter? Estimating the causal effects of income on happiness. *Empirical Economics*, *39*, 77-92.

Putnam, R. D. (2000). Bowling alone: The collapse and revival of American community. *Simon Schuster*.

Putnam, R. D. (1995). Bowling Alone: America's Declining Social Capital. *Journal of Democracy, 6*(1), 65-78.

Ram, R. (2010). Social capital and happiness: Additional cross-country evidence. *Journal of Happiness Studies*, *11*(4), 409-418.

Reyes-García, V., Babigumira, R., Pyhälä, A., Wunder, S., Zorondo-Rodríguez, F., & Angelsen, A. (2016). Subjective wellbeing and income: Empirical patterns in the rural developing world. *Journal of Happiness Studies*, *17*, 773-791.

Rodríguez-Pose, A., & Von Berlepsch, V. (2014). Social capital and individual happiness in Europe. *Journal of Happiness Studies*, *15*, 357-386.

Sachs, J. D. (2006). *The end of poverty: Economic possibilities for our time*. Penguin.

Sarracino, F. (2010). Social capital and subjective well-being trends: Comparing 11 western European countries. *The Journal of Socio-Economics*, *39*(4), 482-517.

Schlossarek, M., Harmáček, J., Seidlová, A., & Suchá, L. (2024). Inequalities and social capital as factors of subjective well-being: Case study from Western Province, Zambia. *Journal of Happiness Studies*, *25*(7), 93.

Stevenson, B., & Wolfers, J. (2008). *Economic growth and subjective well-being: Reassessing the Easterlin paradox* (No. w14282). National Bureau of Economic Research.

Veenhoven, R. (1991). Is happiness relative? *Social Indicators Research*, *24*, 1-34.

Veenhoven, R. (1984). The concept of happiness. In *Conditions of happiness* (pp. 12-38). Dordrecht: Springer Netherlands.

Weinstein, N., & Stone, D. N. (2018). Need depriving effects of financial insecurity: Implications for well-being and financial behaviors. *Journal of Experimental Psychology: General*, *147*(10), 1503.

Woldehanna, T., Tafere, Y., & Yonis, M. B. (2022). Social capital as a double-edged sword for sustained poverty escapes in Ethiopia. *World Development*, *158*, 105969.

Woolcock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research, and policy. *The World Bank Research Observer*, *15*(2), 225-249.

World Bank. (2025a). Global Economic Prospects, June 2025. Conference edition. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO. Available from https://openknowledge.worldbank.org/server/api/core/bitstreams/8912c157-f0e7-4d9e-b6f3-94ae0940e458/content

World Bank. (2025b). Poverty and Inequality Platform (version 20250401_2021_01_02_PROD) [data set]. pip.worldbank.org. Available from https://pip.worldbank.org/home

Zhang, Y., Zhou, X., & Lei, W. (2017). Social capital and its contingent value in poverty reduction: Evidence from Western China. *World Development*, *93*, 350-361.

Part B: African Case Studies

Kenya

An analysis of Social Support Indicators of Wellbeing among Recovering Substance Use Disorder Patients in Kenya

Statement of the Problem: Substance use is a global challenge that threatens the future of societies. Due to social changes resulting from modernization and globalization, the population of individuals suffering from Substance Use Disorder (SUD) has increased leading to adverse effects on the wellbeing of affected individuals, their families and communities. In Kenya, excessive and unhealthy consumption of substances have emerged as a major hindrance to the social-economic development and wellbeing of the people. To address substance use, the government of Kenya has put in place the necessary legal and institutional frameworks, and stakeholders have enhanced public sensitization on the negative effects of substance use. Yet, new psychoactive substances have emerged, as consumption of existing drugs of abuse continues, implying that current strategies are either ineffective or inadequate.

Considering the positive correlation between social support and wellbeing, and the existence of negative labelling of Substance Use Disorder Patients (SUDPs) by community members, an analysis of the social support indicators of wellbeing among SUDPs may be crucial to the formulation of a substance use prevention and management framework that could be customized to different social-cultural settings. To enhance effectiveness, such a framework should draw best practices from the experiences of those who are successfully recovering from substance use. Many studies have focused on SUDPs in rehabilitation centres, with very few examining their recovery journey within the community, and the role of social support on their wellbeing, hence this study.

Objectives: The study specifically aimed at:

i. Analyzing the factors that push or pull individuals into substance use.

ii. Examining factors that reinforce the commitment to stay drug-free

iii. Isolating the social support needs at different stages of the substance users' journey from initiation to the recovery phase

iv. Assessing the level of perceived social support and wellbeing of recovering SUDPs

v. Evaluating the relationship between social support and wellbeing of recovering SUDPs

Research Methodology: a mixed methods approach was utilized. The Central Kenya region was purposive selected due to high prevalence of substance use. Potential respondents must have stayed drug free for at least two months prior to the study and be residents of Central Kenya.

Snowball sampling was used to reach respondents until saturation level was reached. Key informants and Focus group discussants were purposively selected from each county.

Social support was measured using 'The Multidimensional Scale of Perceived Social Support (MSPSS), while Wellbeing was measured using the 'Personal Wellbeing Index (PWI)' both of which have demonstrated good psychometric performance in terms of reliability, validity and sensitivity across cultures.

A pilot study established good reliability for both scales (α=0.854 for social support; α=0.861 for wellbeing). Field data collection was undertaken between March-June 2025, after which data analysis commenced. The variables 'Social support' and 'Wellbeing' were correlated to test their relationship. A regression analysis then determined the significant predictors of wellbeing. The draft research findings were presented at a stakeholders' validation workshop for scrutiny and further input before finalization of the research report.

Key Findings

Data was collected from 323 respondents, 6 key informants and 3 FGDs.

Push and Pull Factors Influencing Drug Initiation

- peer
- pressure/stressful situations

- curiosity
- desire to escape from harsh reality
- A family environment with celebratory use of alcohol and/or easy access to drugs

Factors that Reinforce the Commitment to Stay Drug-Free

- life-threatening health conditions
- threatened family relationships
- newly established supportive networks who supported without judging
- financial distress
- spiritual inspiration that enhanced hope for better future

Social Support Needs

Social support from family, friends and significant others was needed at all stages of life.

Level of Social Support

Majority of the respondents reported adequate social support. Only 3.7% scored less than half, with 23.8% attaining the maximum score of 84.

Level of Wellbeing

Most respondents attained high scores, with 16.7% scoring less than half, and 3.7% attaining the maximum score of 100%.

Relationship between Social Support and Wellbeing

Correlation test results showed a moderately strong positive relationship between social support and wellbeing (r_s=0.56, p=0.01). The Binary Logistic Regression results established that age, marital status, education, supportive family, and social support from special persons were significant predictors of wellbeing as shown in the next summary Table.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Family Social Support	.074	.026	7.863	1	.005	1.076	1.022	1.133
Special Person's support	.116	.035	11.046	1	.001	1.123	1.049	1.202
Marital status	1.107	.464	5.695	1	.017	3.026	1.219	7.513
Age	.061	.030	4.143	1	.042	1.062	1.002	1.126
Education Level	.490	.205	5.721	1	.017	1.632	1.092	2.437
Average Income	.339	.220	2.374	1	.123	1.404	.912	2.162
Constant	-8.801	1.616	29.659	1	.000	.000		

Conclusion: Age of drug initiation in Kenya is alarmingly low, implying an urgent need for preventive interventions. The protective role of social support against substance use, and its vital role in both recovery and well-being was reaffirmed. A significant positive correlation between social support and the wellbeing of respondents (r_s=0.56, p=0.01) confirms that social support is integral to the enhanced wellbeing of individuals. The regression analysis established that age, marital status, education, family support, and support from special persons were significant predictors of wellbeing where married, older, respondents with higher levels of education, strong family support and supportive special persons have the highest chances of enhanced wellbeing.

The need to decriminalize drug addiction was underscored, with a strong recommendation to use the term *'Person Recovering from Substance Use Disorder' (PReSUD*) because of its recovery orientation as opposed to 'drug addict'.

Recommendations: the study recommends a multi-faceted approach focused on early prevention and sustained support comprising:

- Implementation of age-appropriate drug prevention curriculum starting from pre-school.
- Intervention strategies targeting parents of young children.

- Destigmatization Campaigns.
- Capacity Building of PReSUDs.
- Central coordination of stakeholders by Karatina University to ensure translation of study recommendations into evidence-based programmes.

Tanzania

Summary of the Research Work under the WISER-Project in Tanzania

Our Tanzania-based research team was led by Dr. Martin Chegere, Senior Lecturer in the Department of Applied Economics at the University of Dar es Salaam. He collaborated with Ms. Winnie Muangi, Assistant Lecturer in the same department and a final-year PhD candidate at the University of Reading. Our work in Tanzania examined two interconnected dimensions of human well-being: subjective well-being (SWB), shaped by emotional experiences and social capital, and the influence of food security on life satisfaction across multiple domains. Together, these studies provide a comprehensive understanding of the psychological, social, and economic factors that shape the lived experiences of Tanzanians, highlighting both the resilience fostered through community structures and the vulnerabilities arising from economic and nutritional challenges. Beyond their substantive insights, the research also demonstrates the value of combining primary data with secondary national datasets to assess human well-being, emphasizing the methodological breadth available to researchers working on quality-of-life issues in low- and middle-income countries.

First Study: Positive Affect, Life Satisfaction, and the Role of Social Capital: A Study of Tanzanian Communities

The first study examines the relationship between positive affect (PA), life satisfaction (LS), and social capital across 397 respondents from ten districts representing all major geographical zones of Tanzania. Using mixed methods, survey data analyzed quantitatively alongside focus group discussions, it illuminates a tension between emotional vitality and cognitive assessments of life conditions.

Respondents commonly report high levels of positive emotional states: enthusiasm, inspiration, alertness, and excitement, suggesting that day-to-day life is marked by resilience, hopefulness, and emotional energy. Negative emotional states such as fear, guilt, and irritability are far less prevalent, indicating low levels of acute psychological distress. This aligns with prior findings in African SWB research, where individuals often maintain strong momentary happiness even in the face of socio-economic constraints.

However, despite high positive affect, life satisfaction is strikingly low. Across all SWLS items, a majority of participants express dissatisfaction with their life conditions, achievements, and prospects. Many disagree that their life is ideal, that they have secured the important things they want, or that their living conditions are excellent. An exception lies in the domain of acceptance: many indicate that they would change little if they could live life over, suggesting resignation or cultural attitudes that emphasize contentment despite hardship.

Social capital, the networks, trust, reciprocity, and community participation embedded in Tanzanian social life, emerges as a double-edged factor. On the positive side, respondents feel strongly connected to their communities and participate actively in social events. Close social relationships appear to buffer emotional stress and foster positive affect. Trust, when present, is strongly associated with higher life satisfaction and serves as a central mediator between emotional well-being and cognitive evaluations of life.

Yet the same social structures also impose substantial burdens. Many participants experience financial strain due to social obligations, emotional pressure to conform to communal expectations, and role overload arising from participation in extended family networks. Over half of respondents report regularly sacrificing personal needs to meet communal responsibilities. High levels of vigilance (“Be alert in the neighborhood”) reveal anxieties about security, undermining the potential benefits of social cohesion.

Statistical analyses reinforce these findings. Trust and reciprocity strongly enhance life satisfaction, whereas network size and community participation, often linked with reciprocal demands, correlate negatively with LS. Positive affect predicts life satisfaction, but its influence diminishes when trust is included in regression models, indicating that trust is a key pathway through which emotions translate into cognitive evaluations of life quality.

In summary, the study reveals a paradox: Tanzanians experience rich emotional positivity supported by strong social bonds, yet structural and economic constraints, alongside burdensome social obligations, depress their long-term life satisfaction.

Strengthening trust-based social capital while reducing the economic costs of communal participation could significantly improve life satisfaction.

Second Study: Food Security and Subjective Well-Being in Tanzania

The second study analyzes four waves of the Tanzania High-Frequency Welfare Monitoring Phone Survey (HFWMPS), using Correlated Random Effects (CRE) probit models to examine how food security affects subjective well-being at national scale. It explores general well-being, food-related SWB, health-related SWB, and income-related SWB, while also assessing how food availability and prices shape food insecurity.

The findings are unambiguous: food insecurity strongly and consistently reduces subjective well-being across every domain. Individuals facing worries about food, inability to eat healthy meals, reduced diet diversity, skipped meals, or full days without food experience significantly lower levels of happiness and satisfaction.

General life satisfaction is highly sensitive to food availability. Each food insecurity indicator strongly predicts reduced welfare. Marginal effects from the CRE models show that being food insecure, whether reflected in worry, hunger, or compromised diet, substantially lowers the probability of reporting happiness. This demonstrates that chronic nutritional stress translates directly into psychological stress and diminished life satisfaction.

Food-related SWB, unsurprisingly, is even more tightly linked to food insecurity. For example, running out of food or being unable to access healthy options dramatically increases dissatisfaction with one's food situation. Experiences of hunger, such as going a whole day without eating, show the strongest negative effects, reflecting the immediate emotional and physical consequences of food deprivation.

Health-related SWB also declines with food insecurity. Poor diet, skipped meals, and hunger episodes significantly increase the probability of reporting poor health satisfaction. This highlights the role of nutrition in both perceived and actual health outcomes: inadequate food directly undermines physical well-being and indirectly drives psychological distress.

Income-related SWB is similarly affected. Those facing food insecurity are more likely to feel financially insecure, revealing the close relationship between food access and economic perceptions. Because food is a primary expenditure for low-income households, food shortages serve as a signal of economic vulnerability, reinforcing dissatisfaction with income.

Beyond individual experiences, the study assesses societal determinants of food insecurity. Availability of staple foods, maize flour, rice, and beans, significantly reduces food insecurity, while increases in their prices worsen it. Conversely, beef availability shows a counterintuitive positive association with food insecurity, possibly reflecting affordability constraints: beef may be available but inaccessible to low-income households.

Food prices exert strong upward pressure on food insecurity, reflecting inflationary vulnerabilities. Rural households are particularly affected, although demographic factors such as sex (with women more likely to be food insecure) also play a role.

Overall, this study demonstrates that food security is a foundational determinant of subjective well-being. Improvements in food availability, price stabilization, and nutrition access are essential for enhancing life satisfaction, health, and emotional well-being.

Integrated Insights Across the Two Studies

Together, the studies reveal that Tanzanians display strong emotional resilience but low life satisfaction, with social capital offering support while imposing burdens. Food insecurity significantly undermines well-being across emotional, cognitive, and health dimensions, amplified by structural economic pressures. Using both primary and secondary data enriched the analysis, showing the value of diverse datasets for assessing quality of life in Tanzania.

Ghana

Networks of Survival: How Social Capital Sustains Women's Well-Being in Ghana's Informal Economy

Context and Objectives

The Ghana Country Study is part of the EU Horizon WISER project (Deliverable D4.6, Task 4.5) on how communities' social capital relates to economic growth and well-being in Sub-Saharan Africa. It focuses on Kumasi, Ghana's second largest city, which exemplifies rapid urban growth and a large informal economy. Post-COVID macroeconomic shocks have hit Ghana hard: by late 2022 inflation exceeded 50%, public debt restructuring cut household savings, food prices spiked and credit tightened. In this climate, informal vendors (mostly women) lack formal safety nets and rely on community networks to cope. Kumasi's informal markets—heightened by large redevelopment projects that displaced vendors—thus provide a "living laboratory" to study how social networks buffer economic stress.

The study's overall objective is to analyze how social capital sustains well-being and economic resilience during hardship in Ghana's urban informal economy. Five research questions guide the work: the nature of Kumasi vendors' social capital (structural vs cognitive), the strength of social capital in predicting life satisfaction (controlling for other factors), whether social capital mediates shocks' impact on well-being, whether trust or market governance moderate the social capital–well-being link, and how social capital contributes to economic resilience and growth potential in the informal sector. This Ghana case thus provides the empirical base for cross-country synthesis under WISER.

Methodology: A cross-sectional survey was conducted in early 2025 using stratified random sampling across eight municipalities. The research employed composite indices for Social Capital (SCI), Vulnerability (VULN), and Well-being (WB), and used advanced statistical techniques, including regression, mediation, moderation, and cluster analysis.

The 704 respondents were broadly representative of Kumasi's informal traders. Key demographics: most vendors were aged 25–44, with varying education (from no schooling to tertiary) and marital status. About two-thirds were fixed-stall traders and one-third hawkers (mobile vendors). Many traded in central transport hubs (e.g. Kejetia) while others served neighborhood markets. The majority had household responsibilities (children) and no formal social protection (pension, health insurance). This profile underpins how personal circumstances intersect with social capital and vulnerability.

Key Findings

The results show that vulnerability is a powerful and independent driver of well being. Women in the highest vulnerability quintile recorded average life satisfaction of about three point zero, compared to three point eight among those in the lowest quintile. Harassment by task force officials, threats of eviction, theft of goods, unpredictable daily income, flooding, and extreme heat were the most damaging shocks. Vulnerability varied across space and social group. Markets at the urban core, such as Kejetia, recorded higher vulnerability. Widows and divorced women were more exposed than married women. Women without formal education also faced higher risk. Every dimension of precarity lowered life satisfaction.

Social capital significantly improved well-being. The mean social capital index was fifty eight point seven out of one hundred. Married women and stallholders possessed stronger networks than widows and hawkers. Education amplified network strength. Tertiary educated women recorded average scores above sixty three, compared to fifty five among those with no education. Membership in informal financial groups such as susu associations played a central role. Nearly half of all women belonged to a susu group, and such membership enhanced reciprocity and resource sharing.

Regression models demonstrated that social capital remained a strong predictor of well-being even after controlling for income, demographics, and shocks. A one standard deviation increase in social capital was associated with a zero point two eight increase in life satisfaction. Women in the highest social capital quintile reported average well-being of about three point nine, while those in the lowest quintile scored

approximately three point two. Social capital therefore acted as a form of informal insurance that provided credit, information, labour support, and protection.

The analysis further established that vulnerability partially mediates the relationship between social capital and well-being. More than half of the positive effect of social capital operates through the reduction of vulnerability. Women with strong networks experienced fewer disruptions to income and slightly more predictable trading conditions. High social capital reduced exposure to harmful events by an estimated twelve to fifteen percent. Networks therefore do more than offer emotional support. They reduce actual risks.

The effect of social capital was also moderated by trust and market conditions. High trust magnified the benefits of networks. Women who possessed both strong social capital and high trust scored life satisfaction of about three point eight. Those with low trust scored only three point four, even when network strength was similar. Institutional trust was rare. Fewer than thirty percent of traders trusted municipal authorities or the police. However, among those who did, well-being rose further toward three point nine because institutional trust created a sense of safety and predictability. Market infrastructure also shaped outcomes. Women in clean and safe markets reported average well-being of three point eight, compared to three point two in markets prone to flooding or poor sanitation.

Cluster analysis identified three resilience profiles. The first cluster, described as socially buffered and safe, consisted of women with strong networks and low vulnerability who operated in comparatively safe markets. Their average well-being was about four point one. The second cluster, the precarious group, had low social capital, high vulnerability, and poor market environments. Their average well-being was three point four. The third cluster consisted of economically secure women with moderate networks and reasonable market conditions, scoring around three point eight. Income alone raised welfare, but it did not achieve the well-being levels of women in safe and highly networked settings. The findings show that the highest well-being emerges where networks and supportive environments converge.

Social capital also strengthened economic resilience. At the micro level it operated as informal insurance. Members of susu groups and traders with dense relational networks recovered faster from shocks, restocked more easily, and maintained more consistent revenue flows. These mechanisms formed the basis of micro level growth. Rotating credit groups provided capital for inventory expansion, stall improvements, and diversification of goods. Associations enhanced bargaining power and helped traders negotiate fairer fees. Members of such groups earned eight to ten percent more than isolated traders.

At the meso and macro level these individual outcomes aggregate into broader economic stability. Social capital enables sustained trading activity during downturns, stabilising urban markets and supporting household consumption. Gains in subjective well-being also reinforce productivity. Reduced stress and improved mental health support regular attendance and consistent output. Social capital therefore produces a virtuous cycle linking resilience, productivity, and inclusive urban growth.

There are also limitations. Some groups such as widows, hawkers, and women without education are excluded from the strongest networks. Sustained reliance on reciprocity may produce fatigue. A lack of bridging ties to formal institutions keeps many communities locked within horizontal support systems without structural transformation.

Policy Implications

The findings lead to several targeted policy recommendations:

- **For Municipal Authorities:** Enforce anti-harassment measures, implement transparent stall-allocation systems (prioritizing vulnerable groups like widows), and invest in essential market infrastructure (clean toilets, drainage, lighting).
- **For National Government:** Integrate informal vendors into social protection frameworks through widow-support grants and emergency cash transfers. Recognize and resource trader associations.
- **For Development Partners:** Support the digitization of informal savings groups (*susu*), fund comparative research across Sub-Saharan Africa, and promote participatory governance models that rebuild institutional trust.

- **Cross-Cutting Principle:** Interventions must first address structural vulnerabilities to unlock the full potential of social capital.

Conclusion

The study concludes that social capital is a decisive determinant of wellbeing in Kumasi's informal economy. It matters because it reduces vulnerability. Networks and supportive market governance jointly create the highest levels of life satisfaction. Policymakers must therefore regard social capital as a development resource. Investments in infrastructure, transparent governance, social protection for vulnerable women, and stronger trader associations will unlock the full contribution of community networks.

Part C: Cheerful Discontent: Understanding the Well-being Paradox in Sub-Saharan Africa

1 Introduction

How individuals feel about and evaluate their lives and experiences is often highly correlated. However, in Sub-Saharan Africa (SSA), the relationship is much weaker than in Western countries, revealing a disconnect between these two complementary components of subjective well-being (SWB).

According to the World Happiness Report (WHR), SSA countries consistently perform poorly in life evaluative rankings, with most SSA countries scoring between 3 and 5 on the Cantril ladder (the evaluative component of SWB), placing over 80% in the bottom quartile of the rankings. Most notably, the 2025 World Happiness Report ranks Mauritius (5.83), the highest-ranking country in SSA, at number 78 out of 147 countries (Helliwell et al., 2025).[2]

In contrast, when we consider positive affect (the emotional component of SWB), we observe that there are numerous SSA countries where people report being happy in daily life while being dissatisfied with life in general (Helliwell et al., 2025). For example, Senegal was ranked first in terms of positive affect (0.86) in 2025, despite having a life ladder score of 4.85 and a ranking of 107th (Helliwell et al., 2025).

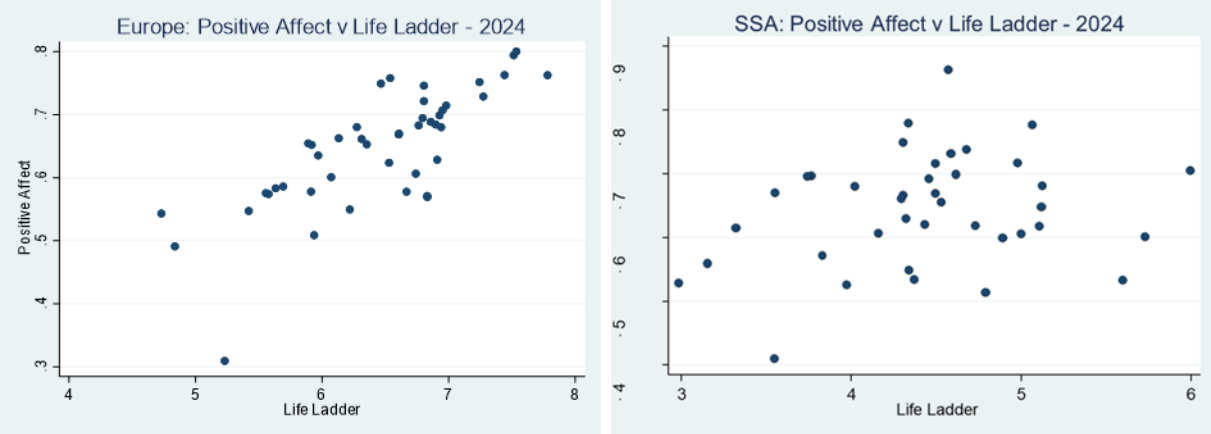
This paradox, where individuals feel happy yet evaluate their lives poorly, has been described as "cheerful discontent" in the context of South Africa (Rothman & Veenhoven, 2013), and its converse, "contentedly despairing."[3]

[2] Low life evaluation scores of SSA countries can also be found in cross-national research based on the World Values Survey (WVS) and are typically associated with lower levels of economic development and institutional quality (Veenhoven & Berg, 2013). The WVS asks respondents the following evaluative wellbeing question: "All things considered, how satisfied are you with your life as a whole these days?" respondents need to rate their satisfaction on a scale from 1 to 10, where 1 means "completely dissatisfied" and 10 means "completely satisfied". However, an exploration of the difference between affect scores and life evaluation scores is beyond the scope of this paper.

[3] In the literature on unemployment and SWB in the Western world, this phenomenon is also known as 'Dissatisfied with life but having a good day' (Knabe et al., 2010).

Gallup World Poll 2024 country-level data confirm this: positive affect and life evaluation correlate strongly in Western countries (r = 0.76; left-hand side of Figure 1). However, in SSA (right-hand side), the Pearson correlation coefficient (r = 0.19) shows a positive, but weak linear relationship. This implies that the two components vary largely independently of each other in SSA. Therefore, at first glance, it seems that in most SSA countries, a situation of "cheerful discontent" (higher positive affect than ladder score) prevails. This phenomenon has also been documented in previous research (Rothman & Veenhoven, 2013; Blanchflower & Bryson, 2024); however, no empirical studies have provided plausible reasons for its existence.

Figure 1. Positive affect vs life evaluation (2024); Europe and SSA



Although previous research on SWB in SSA (see sections 2.2-2.3) has documented a disconnect between the affective and evaluative dimensions, most studies rely on macro-level indicators, standard regression techniques, or small-scale qualitative approaches. Some of these studies have examined the correlation between the two dimensions. While such analyses are informative about average co-movement, they cannot directly capture the magnitude of the disconnect either at the individual level or in aggregate. Moreover, correlation and regression analyses may obscure underlying heterogeneity, as regions can exhibit positive yet distinct relationships.

To address these shortcomings and better understand the source of the disconnect in SSA, we construct an individual-level positive affect–life evaluation (PA–LE) balance using large-scale microdata. This single difference measure (the balance) enables us to quantify the disconnect and examine its distribution across regions. By subtracting

the two components, we can identify the prevalence of individuals who are *cheerfully discontented*. Furthermore, modelling and comparing the balance across regions allows us to contribute directly to explaining this paradox in SSA. Our PA–LE balance does not conflate the two complementary dimensions of SWB; rather, it represents a third construct that captures the degree of alignment between affect and evaluation. This new variable reflects the coherence between how individuals *feel about* and *evaluate* their lives, offering a theoretically meaningful indicator of well-being and a valuable concept for empirical analysis.

Given the above, this study addresses the following research questions: (i) How does the proposed PA–LE balance compare with previous correlational analyses, and what additional insights does it offer? (ii) What factors predict the PA–LE balance in SSA, and are these predictors similar to those observed in Europe? and (iii) If the key predictors are the same, why does SSA differ and what underlies these relationships across regions?

To provide an answer to these research questions, our analysis draws on Gallup World Poll microdata (2013–2024) for 39 SSA countries and 27 Western countries. We apply an eXtreme Gradient Boosting (XGBoost) model to train our data to determine the most important features (factors) influencing the PA–LE balance. Subsequently, we evaluate the model's performance by testing its ability to predict the balance on an unseen dataset. Furthermore, we rely on SHapley Additive exPlanations (SHAP) to explain the output of our XGBoost model. SHAP uses concepts from cooperative game theory to assign a marginal contribution per observation for each feature (variable) for its contribution to a specific prediction. Using SHAP mean absolute values will inform us about the ranking (absolute importance) of our features, while the SHAP mean signed values will show us the direction (positive or negative) and magnitude of each feature's predictive relationship to the PA-LE balance. Using SHAP's dependency plots, we identify the relationships between the feature value and its marginal contributions in predicting the PA–LE balance.

Our findings confirm previous studies, indicating that the PA–LE balance is widely distributed in SSA, which highlights heterogeneity, ranging from cheerfully

discontented (positive balance) to contentedly despairing (negative balance). More specifically, for SSA, roughly two-thirds of the sample fall into the cheerfully discontented category, indicating that most people feel happier than they evaluate their lives. This wide dispersion in SSA mirrors the low correlation previously observed between positive affective and life evaluation. In contrast, in Europe, the balance is narrowly distributed, with approximately the same number of individuals classified as cheerfully discontented and contentedly despairing, suggesting a more congruent evaluation of life and positive affect.

When examining the drivers of the PA–LE balance, we find that two subjective factors, individual optimism and negative affect, explain about two-thirds of the variation in both SSA and Europe. After establishing that the predictors are similar across regions, we explore what underlies them to understand why SSA differs. The findings suggest that individuals in SSA can display both low negative affect and low optimism. Strong social ties and satisfaction with their communities help buffer daily negative experiences such as sadness, worry, and stress, which supports higher levels of positive experiences. At the same time, resource constraints and limited future prospects, especially among young people, reduce optimism about the future, which is a key driver of life evaluations.

This paper contributes to the existing literature on subjective well-being in three distinct ways. First, it develops a new individual-level measure of the Positive Affect–Life Evaluation (PA–LE) balance, which indicates the difference between how people feel and how they judge their lives. This measure contributes to the existing literature that has adopted correlation and regression analyses by quantifying both the magnitude and direction, enabling comparisons across regions. Second, it applies eXtreme Gradient Boosting (XGBoost) with Shapley value explanations (SHAP) to identify the features most important in predicting the PA-LE balance and how these features differ across individuals within regions. Different to traditional econometric approaches that estimate average effects, this method captures individual-level variation and non-linear relationships often hidden in aggregate models. Third, it integrates insights from both cognitive and affective dimensions of SWB to generate

policy-relevant implications for closing the balance by addressing economic expectations while leveraging emotional resilience and community strengths.

The remainder of the paper is structured as follows. The next section presents our theoretical framework and provides a literature review that focuses on studies examining variables associated with the affective and cognitive components of SWB in SSA. The data, selected variables and methodology are discussed in section 3. The results are presented in section 4, while the paper concludes with policy recommendations in section 5.

2 Background

2.1 Subjective well-being

Subjective well-being (SWB) is "*the degree to which an individual judges the overall quality of his or her life-as-a-whole favourably*" (Veenhoven, 1984, Chapter 2). According to Veenhoven (2000), SWB draws on two primary sources: emotional states and cognitive judgments; so, it depends on how people feel and how they evaluate their lives.

Affective measures of SWB capture positive and negative emotions (e.g., joy, calm, anger, sadness), whereas evaluative measures assess life satisfaction or contentment with one's circumstances. In this research, we focus on positive affect and a specific measure of evaluative well-being, the Cantril ladder, which measures the degree of contentment or how people's current circumstances compare to their best and worst conceivable life situations (Cantril, 1965).

Affective and evaluative well-being often diverge (Rojas & Veenhoven, 2013), as different factors may influence them (Kahneman & Deaton, 2010; Diener et al., 2010). Veenhoven (1984; 2009) argues that affective well-being (moods and discomfort) reflects whether basic needs are met, signals that are largely unconscious and evolutionarily older than cognitive evaluations. By contrast, evaluative well-being is shaped by culture and personal aspirations. While cognitive standards for life evaluation vary widely across individuals and cultures, affective responses are thought

to be more biologically grounded and thus more stable across populations. Veenhoven emphasises that the "affective compass" is evolutionarily older, and that the human cognitive orientation system evolved as an addition rather than a replacement, which is consistent with research on the "primacy of affect" (Zajonc, 1980). Consequently, feelings often dominate when people evaluate their overall SWB: rather than consciously comparing aspirations to achievements, individuals frequently infer their overall SWB from how they generally feel.

De Boer (2025) addresses the persistent finding that evaluative SWB (life satisfaction) correlate more strongly with income and material goods, while affective measures are more closely linked to perceived freedom. Drawing on dual process theory, he argues that this reflects a functional division of cognitive labour: slow, deliberative processes (Type 2) evaluate and compare material goods, whereas fast, automatic emotional processes (Type 1) safeguard autonomy and the ability to choose among actions. Using a decision-theoretic example, De Boer illustrates how emotions are oriented toward protecting freedom while deliberation is directed toward weighing material outcomes. He concludes that the difference between evaluative and affective SWB measures arises from their reliance on distinct cognitive systems, though local contexts may alter the strength of these associations.

Indeed, while De Boer's argument highlights a universal cognitive distinction between affective and evaluative SWB, its expression may differ across cultural contexts. In SSA, for instance, autonomy is often understood in relational rather than individualistic terms (Ikuenobe, 2015). In SSA, autonomy is often relational (Ikuenobe, 2015), and compared to the Western world, SWB evaluations in SSA might depend more on obligations and harmony with others rather than on personal goals (Lambert et al., 2020). Hence, affective SWB can remain high despite dissatisfaction with life: communal ties buffer emotional states, where life evaluations reflect structural realities, such as poverty. Life evaluations can be more negative in SSA because communal constraints, such as unemployment for youth or collective poverty (i.e., local conditions), weigh more heavily in judgments. Likewise, *Ubuntu* and related philosophies that stress communitarian values are more prevalent in SSA than in the

West (Metz, 2011). Along these lines, social rituals and kinship networks sustain affective SWB, while communal prospects drive evaluative well-being. Hence, life evaluations can be low even if one's daily affect is positive. This will be further explored in the next section.

2.2 Affective and evaluative well-being in SSA

Understanding SWB in SSA requires multidimensional, culturally grounded approaches that reflect the region's diverse sociocultural, economic, and political contexts. Research combines quantitative analysis of large international surveys, such as the World Values Survey (WVS) and Gallup World Poll (GWP), with qualitative work using interviews, ethnographies, and participatory methods that capture indigenous views of well-being. These qualitative studies highlight the relational, spiritual, and moral dimensions that are often absent from standardised metrics.

Evaluative well-being, typically measured through life satisfaction or the Cantril ladder, is highly sensitive to structural and institutional conditions. Regression and multilevel analyses link low income, unemployment, poor health (HIV/AIDS prevalence, lower life expectancy), and food insecurity to poorer evaluations (Deaton et al., 2009; Ngamaba, 2016; Calvo et al., 2012). Freedom of choice and perceived autonomy consistently predict higher life evaluation, while national indicators such as GDP per capita, corruption, and governance quality explain a significant portion of the variation (Minkov, 2009; Joshanloo, 2019; Joshanloo & Bond, 2023).

In contrast, affective well-being in SSA has been associated more with relational and psychosocial factors than with material and institutional conditions. GWP survey data indicate that, despite widespread poverty, many African populations report high levels of daily happiness and emotional positivity. Rojas and Veenhoven (2013) found that countries such as Kenya and Malawi displayed high affect but low contentment, indicating a disconnect between emotional state and cognitive evaluation.

Optimism and negative affect play distinct roles in separating daily positive emotions from overall life evaluations in SSA. Studies using adaptation and social comparison frameworks show that individuals employ optimism as a survival strategy and view their futures more favourably despite acute material hardships (Graham & Hoover,

2007; Clark & D'Ambrosio, 2018). In these studies, high optimism and low negative affect buffer the impact of poverty such that life evaluations remain low even when positive affect is sustained. Other studies stress that life evaluation is more closely tied to material conditions, income, health, food, and shelter, while positive affect is driven by psychosocial factors and resilient social ties (Diener et al., 2010; Kaufman et al., 2022). Dispositional optimism, as measured in comparative and longitudinal designs, moderates these relationships, with some evidence suggesting that optimism is more strongly linked to life evaluation when material prospects are improving (Baranski et al., 2021). Social capital studies further underscore that robust support networks reinforce positive affect even in challenging economic contexts (Cramm et al., 2010; Addae & Kühner, 2022).

Qualitative studies deepen this understanding by emphasising the importance of social relationships, spiritual life, and cultural identity in sustaining affective well-being. Evidence from Uganda, South Africa, and Tanzania shows that peace of mind, respect, and communal harmony outweigh material wealth in shaping emotion (Ferrari, 2022; White & Jha, 2018; Rishworth et al., 2019). Other studies link well-being to moral conduct, inclusion, and spirituality, with community participation buffering emotional distress, especially among women and older adults (Ferrari, 2022; White & Jha, 2018; Kaufman et al., 2022).

A consistent finding in research is the disconnect between evaluative and affective well-being, and a pattern emerges: evaluative well-being mirrors structural disadvantage, while affective well-being remains resilient, often matching or exceeding levels in richer regions (Diener et al., 2018). Brulé and Veenhoven (2015) mapped global patterns of affect and contentment, showing African countries frequently cluster in the high-affect/low-evaluation quadrant, a unique configuration that standard global metrics may misinterpret if they rely only on life evaluation scores.

The conceptual framework by Veenhoven (2015) is also particularly relevant for understanding patterns in SSA, where surveys often reveal high levels of positive affect despite low life evaluation scores. In deprived contexts, positive affect, fueled by fulfilled needs such as strong community ties, spirituality, and social inclusion, can

persist even under economic hardship or weak institutions. These findings caution against relying solely on evaluative measures, which risk overlooking important emotional realities. The concept also helps explain a phenomenon such as "cheerful discontent" (Rothman & Veenhoven, 2013) in which individuals experience frequent positive emotions while rating their lives poorly. Recognising this disconnect also underscores the importance of culturally sensitive approaches to measuring SWB in diverse settings.

The resilience of affective well-being in the face of poverty may be linked to cultural coping mechanisms, strong kinship networks, and spiritual frameworks (Kaufman et al., 2022; Ferrari, 2022; White & Jha, 2018). Studies from Ethiopia, South Africa, and Uganda describe well-being in relational and moral terms, such as being "settled," maintaining family harmony, and earning respect (White & Jha, 2018; Ferrari, 2022; Rishworth et al., 2019). These insights underscore the limitations of applying Western-centric SWB measures without cultural adaptation (Adedeji et al., 2023; White & Jha, 2018).

Spiritual well-being, connection to God, ancestors, or nature, is integral for affective and evaluative well-being (Kaufman et al., 2022; Ferrari, 2022; Adedeji et al., 2023; White & Jha, 2018). These studies highlight how emotional and moral well-being could be high despite material deprivation. Although spirituality can enhance well-being, Joshanloo (2019) suggests religiosity may dampen the effect of emotions on life satisfaction. Overall, these findings stress the need for culturally sensitive frameworks that integrate insider perspectives. Quantitative surveys confirm high affect despite low evaluation, while qualitative accounts explain this paradox through communal and spiritual coping systems that large-scale datasets overlook.

Despite these insights, prior studies analysed affective and evaluative well-being *separately* (and compared *correlations*) rather than constructing and modelling a single variable that represents the difference between them. We note that studies like Brulé and Veenhoven (2015) mapped the *high-affect/low-evaluation quadrant*, and Rojas and Veenhoven (2013) discussed "*contentment vs affect*". However, neither constructed a standardised, individual-level balance measure to compare its dispersion across

regions, ultimately explaining its dispersion with predictors and characteristics that underlie these predictors.

3 Data and Methodology

3.1 Data and sample of countries

In this study, we use data from the Gallup World Poll (GWP), which draws on representative samples of the public in various countries. The annual sample size in each of the nations is approximately 1,000 persons, and Gallup aims to conduct repeated surveys over time. Specifically, we utilise micro-level data spanning the years 2013–2024 for 39 SSA countries, 27 European Union countries, the USA, Canada, New Zealand, and Australia (see Appendix C, Supplementary Information A for a list of countries). With a considerable sample, we employed listwise deletion, removing any observations with missing variables. We were left with 356,315 observations. Additionally, we included weights in our analyses.

3.2 Target/outcome variable

In this section, we explain the construction of our outcome variable, the balance between positive affect and life evaluation.

3.2.1 Life evaluation

Here, we use Cantril's ladder question, which asks respondents: '*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time? 0 is the worst possible life, and 10 is the best possible life for you*'.

3.2.2 Positive affect

For positive affect, we rely on the Positive Experience Index[4], which measures respondents' experienced well-being. Questions provide a measure of respondents'

[4] To test the robustness of the Positive Experience Index we also derive positive affect scores using the aggregated value of joy, laugh and being well-rested on a three-point scale and also include doing something interesting and treated with respect to derive a five-point scale.

positive experiences about *being well-rested, treated with respect, smiling or laughing a lot, doing something interesting and experiencing enjoyment*. The five items are recoded so that positive answers are scored as a "1" and all other answers (including don't know and refused) are scored as a "0." If a record has no answer for an item, then that item is not eligible for inclusion in the calculations. An individual record has a score calculated if it has at least four out of five valid scores (0 or 1). The record's final score is the mean of valid items multiplied by 100. In our analyses, we rescale the indices to a 0-10 index to facilitate comparison with the Cantril ladder.

3.2.3 The positive affect-life evaluation (PA-LE) balance

We determine the balance (i.e., difference) between positive affect and life evaluation as follows:

$$\text{PA} - \text{LE Balance} = \text{Positive Affect} - \text{Cantril Ladder} \quad (1)$$

To test the robustness of the results based on the derived PA-LE balance variable, we also construct a standardised PA-LE balance using standardised variables and equation (1)[5]. If positive affect is higher than expected based on life evaluation, the result is a positive balance, and in the event of a negative value, it is the opposite.

3.3 Predictor variable/features

The selection of our features is well-grounded in theory (section 2.1) and existing literature (section 2.2). We used 20 features from four categories: subjective, objective, demographic and structural. Please see Table B1 in Appendix C, Supplementary Information B for the list of features.

When considering Table 7, we observe that SSA consistently exhibits a wider dispersion in key features compared to data from Western countries.

For the main outcomes, the standard deviation of life evaluation is markedly higher in SSA (2.66 vs. 1.93), whereas for positive affect, it is slightly higher in SSA than in

[5]All models are executed alternating the ordered and standardised balance variables, to test the robustness of the results to scale variance.

Western countries (28.41 vs. 27.24), indicating a misalignment in SSA compared to Western countries. At the same time, both negative affect (measured as an index - 31.41 vs 27.04) and optimism (31.84 vs 30.50 (index)) also display greater variability.

This broader dispersion (measured by SD) extends to demographics, such as income quintile (1.44 vs 1.40) and marital status (0.50 vs 0.49), as well as to several indices and subjective variables, including satisfaction with the place where you live (33.66 vs 26.64), trust in institutions (37.01 vs 33.93), and social life (33.74 vs 26.75).

Table 7. Descriptive statistics

Category	Variable	Western SD	SSA SD
Main outcomes	Positive affect	27.24	28.41
	Life evaluation	1.93	2.66
	Negative affect	27.04	31.41
	Optimism	30.50	31.84
Demographics	Income quintiles	1.40	1.44
	Health problem	0.42	0.45
	Marital status	0.49	0.50
Indices & subjective	Satisfaction with the place where you live	26.64	33.66
	Civic engagement	31.26	31.57
	Trust in institutions	33.93	37.01
	Social life	26.75	33.74
	Freedom	0.39	0.45

Source: Authors' own calculations

Since our dataset covers 39 SSA countries, compared to 27 Western countries from the European Union, this broader cross-country coverage alone introduces more structural, cultural, and socioeconomic diversity, which likely contributes to the higher variance of PA-LE balance observed in Africa. When combined with within-country variation, this helps explain the pronounced heterogeneity and polarisation in the SSA distribution. Overall, SSA exhibits greater heterogeneity in features related to well-

being, as well as demographic and subjective indicators, reflected in higher variances and standard deviations across variables.

3.4 Methodology

3.4.1 eXtreme Gradient Boosting (XGBoost)

XGBoost is a highly efficient and scalable machine learning algorithm implementing gradient boosting for decision trees. XGBoost is based on the gradient boosting framework, where models are built sequentially, and each new model corrects the errors of the previous one. This process continues until a strong predictive model is formed. It is designed for speed and performance, utilising optimisation techniques that support parallel and distributed computing, making it highly scalable for large datasets. Furthermore, it includes regularisation (L1 and L2) to prevent overfitting. The predictive model is used in the construction of SHAP values (section 4).

XGBoost has demonstrated greater accuracy than other methods. For example, Abdurrahim et al. (2020) compared the accuracy of different predictive modelling algorithms and found that XGBoost achieved the highest accuracy score compared to other methods, including logistic regression, naive Bayes classifier, Decision Trees, and Random Forest.

Our XGBoost model is defined in equation (2) as:

$$\mathrm{F_M(x)} = \mathrm{F_0} + \mathrm{v\beta_1 T_1(x)} + \mathrm{v\beta_2 T_2(x)} + \cdots + \mathrm{v\beta_M T_M(x)} \tag{2}$$

Where M is the number of iterations. The gradient boosting model is a weighted $(\mathrm{B_1} \ldots \beta_\mathrm{M})$ linear combination of simple models $(\mathrm{T_1} \ldots \mathrm{T_M})$. $\mathrm{F_M(x)}$ is the PA-LE balance as described in section 3.2.3.

In our study, the data is split randomly into a training and testing dataset with an 80:20 split. We trained the model using the default parameters and refined them to achieve the best fit. We attained the best fit with a tree depth of four and alpha and lambda settings of 0.5. We made use of a termination clause to stop the algorithm if the Root Mean Square Error (RMSE) does not decrease after five iterations.

For each model, performance is evaluated on unseen (test) data using regression-based fit metrics: Mean Absolute Error (MAE), Mean Squared Error (MSE), and RMSE. These metrics validate the model's predictive power and generalisation to unseen data. The RMSE measures the distance between the predicted and observed (actual/true) values, averaged across observations, using the same units as the dependent variable. See Appendix C, Supplementary Information D for a full discussion on fit metrics.

A good model should show similar performance across both training and test sets, with smaller test metrics (smaller errors) indicating better performance.

3.4.2 SHAP values

To interpret model outputs and provide transparency, we apply SHAP (SHapley Additive exPlanations), which decomposes each prediction into additive contributions from each feature using cooperative game theory principles (Lundberg & Lee, 2017).

SHAP values are computed at the observation level (per individual), and the marginal contribution of each feature is quantified to the predicted PA-LE gap.

In this study, we specifically use:

1. SHAP summary plots, which use mean absolute SHAP values to rank features by their overall importance to the PA-LE balance, independent of directionality.
2. SHAP boxplots, which use the average (mean) SHAP values to show the direction (positive or negative) and magnitude of each feature's effect on the PA-LE balance.
3. SHAP dependence plots, which reveal non-linear relationships and potential threshold points in the effect of each feature.

4 Results

In this section, we aim to address the research questions. First, we determine how the PA–LE balance compares to results from previous correlational analyses across regions. Second, we determine the predictors of the PA–LE balance in SSA and

compare these to the predictors for Europe. Lastly, we determine what underlies these predictors across regions in order to answer why SSA is ultimately different.

4.1 PA-LE balance

To test the previously observed correlation between positive affect and life evaluation in SSA and Western countries (low vs high), we use the newly constructed PA-LE balance (refer to section 3.2.3). This single measure will also allow us to capture the magnitude (distribution) and the direction of the misalignment, i.e., whether people are cheerfully discontented or contentedly despairing.

We remind the reader that the balance is derived by subtracting life evaluation scores (0-10) from positive affect scores (scaled from 0 to 10), with a minimum value of -10 and a maximum value of 10.

From Table 8, we observe that the mean PA-LE balance is substantially higher in SSA (2.54) compared to other regions (0.63 in Europe and Australia–New Zealand, and 1.79 in North America). Although the balance is positive on average across all regions, the degree of this cheerful discontent is much stronger in SSA. The standard deviation (3.52) indicates markedly greater heterogeneity in SSA compared with the more moderate variability observed elsewhere (SD ≈ 2.5–3.2).

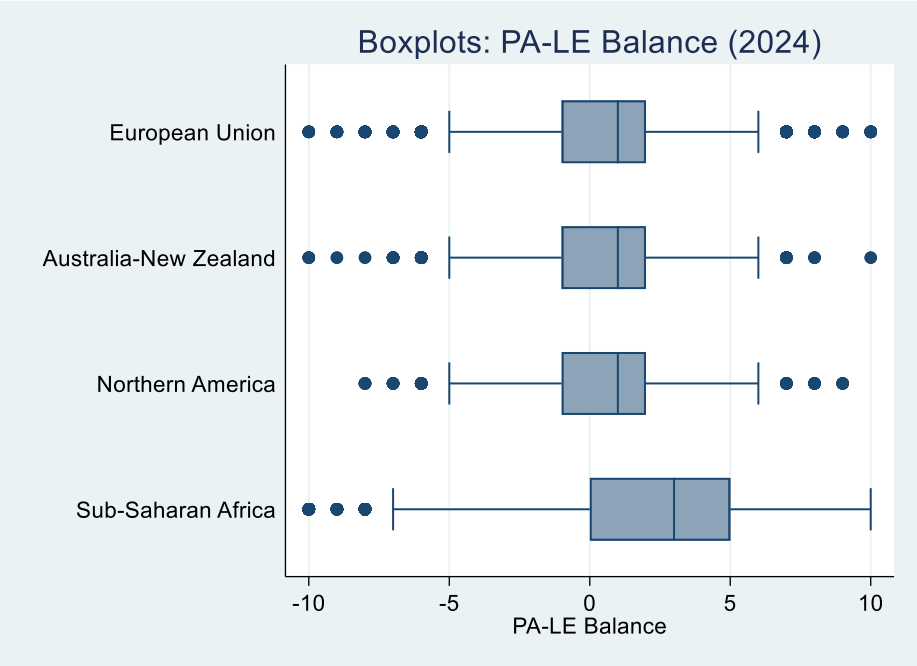
Table 8. Descriptive statistics of the PA-LE balance.

Region	Observations	Mean	Std. Dev.	Min	Max
Europe	178 721	0.626	2.785	−10	10
Northern America	121 010	1.788	3.187	−10	10
Australia & New Zealand	14 199	0.633	2.500	−10	10
SSA	221 591	2.535	3.523	−10	10

From Figure 2, we also see that SSA exhibits a consistently higher and more dispersed PA–LE balance compared to Western regions. With a prevalence of 71% in SSA, we confirm that the majority of Africans are indeed cheerfully discontented, meaning that most people feel happier than they evaluate their lives. In contrast, Western countries, with their narrower distributions, show a prevalence of cheerful discontent of approximately 54%, compared to 52.9% in Australia–New Zealand and 55.8% in North America. This pattern holds not only in the pooled dataset but also across time

(analysis per year). See Figure B1 in Appendix C, Supplementary Information B for the density plot illustrating the regional PA–LE balance prevalence.

Figure 2. PA-LE balance by region (2024)



This combination of prevalence (frequency), intensity (mean), and dispersion (SD) underscores the distinctiveness of the African experience, raising questions about why the PA-LE balance in SSA is so different compared to Western countries.

In subsequent sections, we chose Europe as our proxy for Western countries given their similar characteristics, i.e., high income levels, high life evaluations, and comparative positive affect. Therefore, Europe is the opposite of what is observed in SSA. However, we ran robustness checks that included North America, New Zealand, and Australia, and the results are very similar. These are available from the authors on request.

4.2 Model performance

For our main XGBoost models predicting the PA-LE balance (section 3.4.1), we began by refining the depth of the trees and tested depths between three and ten, finding that four resulted in the lowest RMSE. We set the number of iterations to 100, with a termination clause added (early stop) to stop the algorithm if the RMSE does not

decrease after five iterations. For the Ridge and Lasso parameters, we found that 0.5 each attained the best model.

Overall, the models demonstrate strong aggregate performance. The predicted and observed (true) means are very close in both SSA and Europe, indicating minimal systematic bias and high predictive accuracy at the macro level. For SSA, the mean PA–LE balance gap is 2.54 (true), compared with a mean predicted value of 2.57; for Europe, the corresponding figures are 0.73 (true) and 0.68, respectively. These close predictions suggest that, despite the complexity of SWB data, the models capture the central tendencies of each region with notable precision.

Nevertheless, when evaluated at the individual level, the test metrics do not represent exceptionally low prediction errors. However, they are well below the standard deviation of the dependent variable, implying satisfactory explanatory power. The RMSE values are 3.25 in SSA and 2.67 in Europe, indicating the extent of outliers characteristic of SWB data, particularly the PA-LE balance. Given the outliers, the MAE provides a more reliable measure of fit, with values of 2.57 (SD = 3.52) for SSA and 2.21 (SD = 2.85) for Europe.

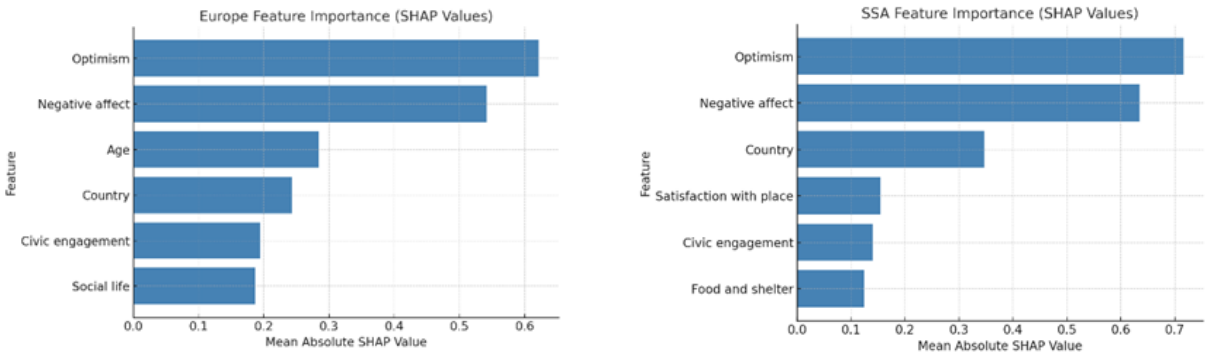
Therefore, considering the wide variation in PA-LE balances, the model performance should be evaluated by the closeness of the predicted and observed (true) means rather than by the RMSE and MAE alone. Refer to Figure B2 in Appendix C, Supplementary Information B for the visual of our true vs predicted PA-LE balance. Taken together, these results suggest that the models are robust in predicting the feature importance analyses using SHAP values.

4.2.2 Feature importance

To determine the predictors of the PA–LE balance in SSA and Europe, we consider the absolute mean SHAP values of each feature, which show the absolute importance of each feature. Figure 3 shows the top six features, and we observe that optimism and negative affect (NX) are the most important features in predicting the PA-LE balance across both regions. In Europe, optimism accounts for 33% (0.72) of the model's average absolute attribution, while negative affect accounts for 30% (0.66), combined explaining more than two-thirds of the PA-LE balance. Similarly, in SSA, optimism

explains 31% (0.62) of the model's predictions, while negative affect explains 28% (0.55); combined, these account for nearly two-thirds of the positive balance. Given that the most important features are the same in SSA and Europe, we require further analysis to explain the disconnect in SSA.

Figure 3. Magnitude (absolute) of feature importance (mean absolute SHAP values) – Europe (left) and SSA (right).



To explore this further, we examined the predictive models of positive affect and life evaluation separately for the different regions[6]. In the predictive models of positive affect, we found negative affect to be the most important feature, while in the model of life evaluation, optimism was the most important feature. This establishes a robust cross-regional pattern: negative affect is the most important feature in predicting positive affective states, whereas optimism is the most important feature linked to evaluations of life.

This finding resonates with De Boer's (2025) dual-process account (section 2.1), which proposes that deliberative cognition (Type 2) underlies evaluative judgments tied to material expectations, while fast emotional processes (Type 1) safeguard autonomy and shape affective states. In our data, optimism is the most important feature in contributing to our predictive model linked to evaluation, while negative affect reflects the affective pathway, together confirming that the mechanisms highlighted by De Boer can be observed empirically across regions.

[6] Results available from authors on request.

4.3 The case for explaining SSA

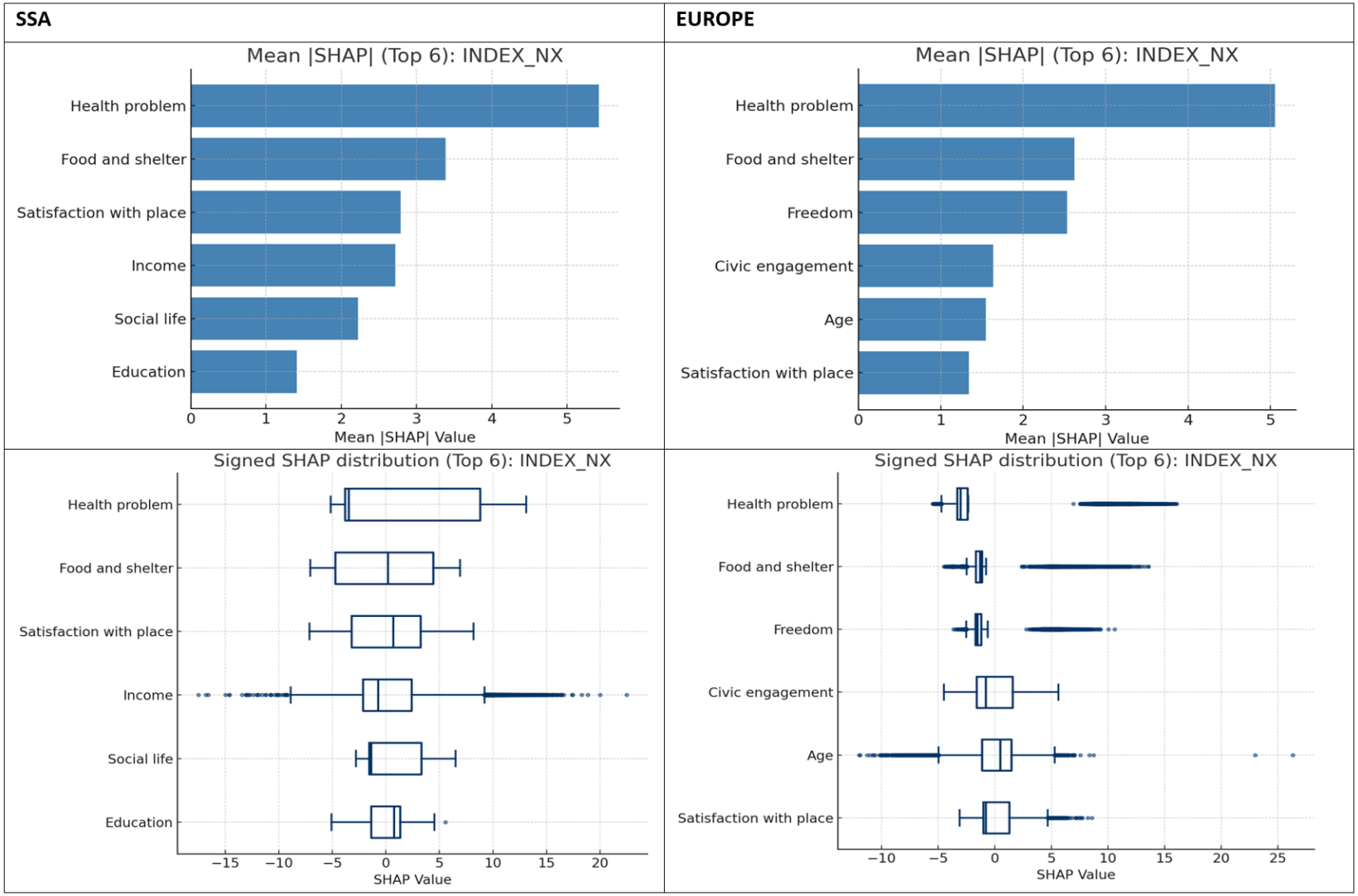
We have established that the core predictors of the PA-LE balance (negative affect and optimism) appear to be universal, yet from section 4.1, we know that SSA shows a more pronounced cheerful discontentment. Therefore, the difference between Europe and SSA does not lie in which features are most important for explaining the PA-LE balance, but rather in what underlies these features. Consequently, we now investigate what predicts negative affect and optimism across regions in order to answer why SSA is ultimately different.

We turn to the SHAP estimations in the mean absolute plots (summary plots) and the mean signed plots (boxplots). We start by comparing the most important factors related to negative affect for SSA and Europe in Figure 4. Next, we consider and compare the features most important for optimism in the two regions in Figure 5.

Considering the absolute means, we find that in both regions, health problems followed by a lack of food are the most important features contributing to negative affect (Figure 4). Considering the mean signed plots (i.e., box plots), we notice greater dispersion in SSA than in Europe, re-emphasising the heterogeneity in SSA. All the features show non-linear contributions, with the distribution of SHAP values crossing the 0-line, implying that in some instances the feature's contribution increases negative affect, while in others it decreases negative affect. The precise relationship can only be obtained once we also consider the dependency plots. The dependency plots in Appendix C, Supplementary Information C illustrate the marginal contribution of each feature to the model's prediction of negative affect. We note that in both instances, health problems and a lack of food and shelter contribute positively, meaning they increase predicted negative affect.

In SSA, we see that after the two dominant features, satisfaction with the place where one lives, income, social support and education level matter, the effects are smaller but still important. From our dependency plots (Appendix C, Supplementary Information C), we see that the marginal contributions of dissatisfaction with place, as well as a lack of social support, income, and education, are associated with higher levels of predicted negative affect.

Figure 4: Negative affect for SSA and Europe



For Europe, other features that matter are freedom, civic engagement, age, and satisfaction with the place where one lives. The dependency plots illustrate the expected relationship, in which the marginal contributions of freedom, satisfaction with place, and age (with a limited effect for those aged 75 and older) decrease negative affect.

Interestingly, there is one surprising relationship; in Europe, we find that "too much" civic engagement can increase negative affect as the marginal contribution of civic engagement becomes progressively weaker as the index increases and eventually turns negative beyond the mid-point of the scale, showing diminishing returns, possibly reflecting overexposure to collective concerns or social fatigue. Therefore, the difference between SSA and Europe is the buffering effects of social support and belonging.

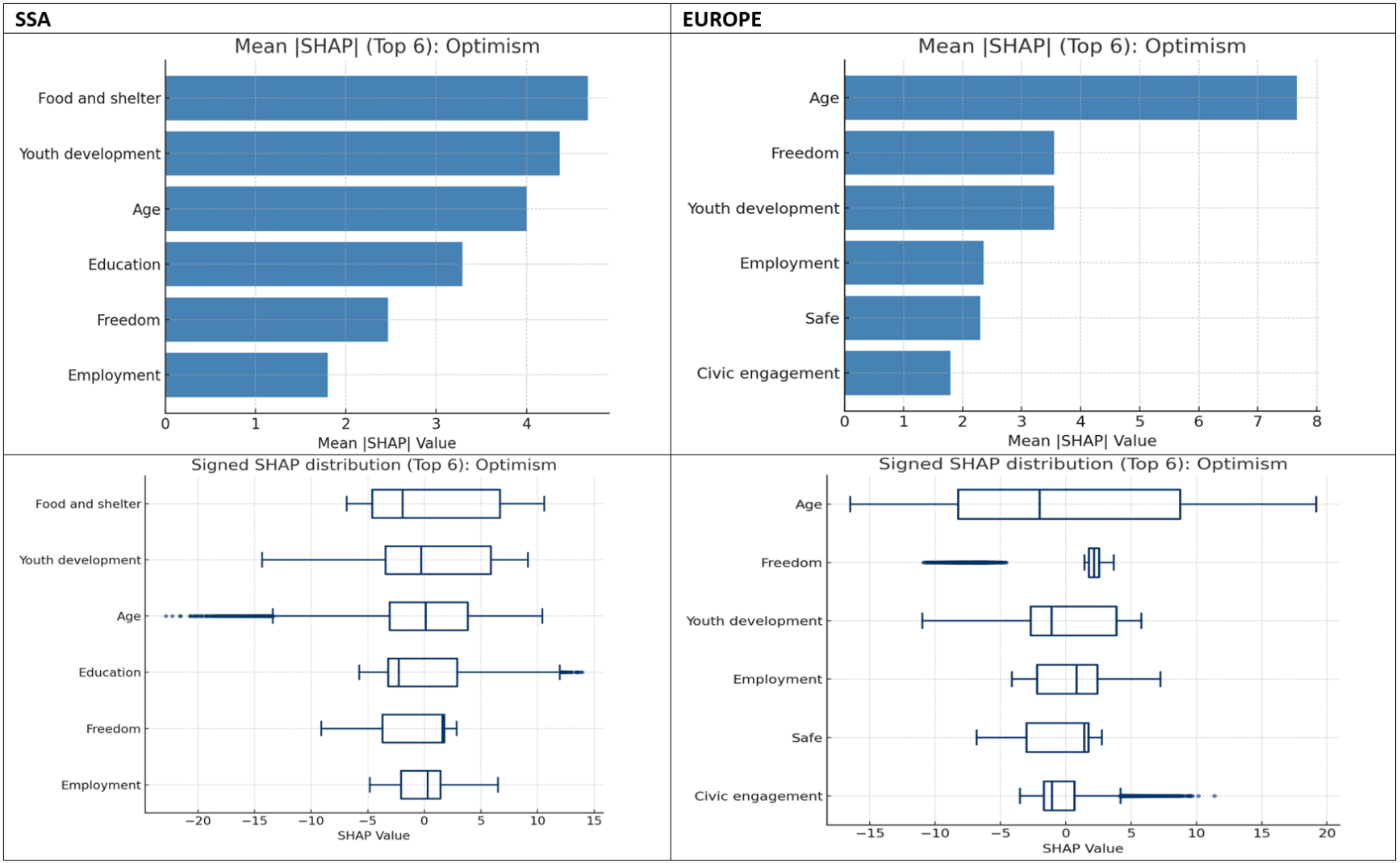
In terms of optimism (Figure 5), we observe that in SSA, the top mean absolute feature, according to the SHAP plots, is the index for food and shelter, which is the dominant positive predictor. This means that if basic needs are met, it translates to positive optimism.

Apart from food and shelter, youth development, age, and education levels are also strong predictors for SSA. Freedom and employment are less important predictors of optimism, though still relevant. Considering the mean signed plot, we see what is expected. All the features show non-linear contributions, with the distribution of SHAP values crossing the 0-line, implying that in some instances the feature's contribution increases optimism, while in others it decreases optimism. A lack of food and shelter, as well as youth development opportunities and education, is negatively associated with optimism. In contrast, freedom and employment are positively associated with optimism. Once again, we note the greater dispersion of feature values in SSA compared to those in Europe (except for age in Europe, which exhibits greater dispersion than in SSA).

In Europe, we find that age is the most important feature, according to the mean absolute shape values. It has the largest predictive importance, with a marginal

contribution that is, on average, negative below 35 years and positive thereafter. Freedom to make life choices and youth development both show generally positive marginal contributions to optimism. We also note that employment, safety and civic engagement matter but play smaller roles.

Figure 5. Optimism for SSA and Europe



We note that SSA has lower levels for those features that are important to increase optimism. Although we find the expected relationships between the marginal contributions of food and shelter, youth development, education, and freedom in predicting optimism, their average levels are lower than those in Europe. Fewer people have enough food and shelter, are optimistic about youth development, and have the freedom to make choices. This means that the predicted optimism remains low, particularly for individuals with a positive balance.

The above leads us to conclude that individuals in SSA can simultaneously exhibit low negative affect and low optimism due to strong social ties and satisfaction with the place where they live (belonging), which buffers day-to-day negative experiences such as sadness, worry, and stress. This, in turn, enables higher levels of positive experiences. In contrast, resource constraints and low expectations, especially about youth prospects, lower optimism about the future (optimism being the most important predictor of life evaluation).

In summary, section 4 showed that (i) in SSA the PA–LE balance is distributed widely reflecting wide heterogeneity, with roughly two-thirds of the sample being cheerfully discontented, whereas Western countries has a narrower variance with approximately the same number of individuals classified as cheerfully discontented and contentedly despairing, (ii) that optimism and negative affect universally predicts the PA-LE balance in SSA and Western countries, (iii) SSA is ultimately different because negative affect is buffered by strong social ties and satisfaction with place of living, but resource constraints and low expectations constrain optimism. These results demonstrate both the universality of well-being mechanisms and the distinct role of social ties and belonging, as well as the structural constraints in SSA.

5 Discussion and conclusion

This study contributes to the growing literature on the multidimensionality of subjective well-being by introducing an individual-level measure that captures the alignment or misalignment between affective and evaluative components. While

positive affect and life evaluation are positively correlated in SSA, their relationship is much weaker than in Western countries, suggesting a disconnect between how people feel and how they judge their lives. Moving beyond correlational analyses, we developed a new metric (the PA–LE balance) to quantify this difference across 39 SSA and Western countries using large-scale microdata from the Gallup World Poll (2013–2024). An interpretable machine learning framework combining XGBoost and SHAP enabled us to predict and explain the determinants of this balance at the individual level.

Our results show that the PA-LE balance is heterogeneous across regions: in SSA, the balance is widely distributed, and a majority of individuals report markedly higher positive affect than life evaluation ("cheerful discontent"), while a smaller group report the reverse ("contented despair"). Conversely, in Western countries, the balance has a narrow distribution, with almost the same number having a positive and a negative balance. This diversity means that a single regional pattern cannot meaningfully summarise the relationship between affect and life evaluation in SSA.

The SHAP analysis shows that optimism and negative affect account for approximately two-thirds of the predicted PA-LE balance across both Western countries and SSA. These results align closely with De Boer's (2025) dual-process framework, in which slow, deliberative cognition shapes evaluative judgments of material conditions, while fast, emotional processes maintain affective stability through perceptions of autonomy and control. In the SSA context, where structural realities constrain optimism, but daily affect remains buffered through social capital and belonging, these dual mechanisms help explain the paradox of "cheerful discontent." Life evaluations follow the deliberative pathway of low economic expectations, while affective well-being reflects the emotional resilience that maintains positive balance despite hardship.

For SSA, policy implications, therefore, follow two complementary pathways. First, structural interventions should aim to raise optimism by expanding economic opportunities, especially for young people. Initiatives such as youth entrepreneurship programs and targeted employment incentives (e.g., the African Union's 1 Million Next

Level Initiative) can help lift expectations and improve life evaluations. Second, social interventions should protect and enhance community-based sources of affective well-being, including social cohesion, neighbourhood safety, and local health or faith-based support networks. Strengthening these everyday buffers is essential for sustaining emotional resilience. Only by addressing both economic and social pathways can societies foster environments in which people are not only cheerful but also genuinely content.

In contrast to SSA, where affective well-being rests on strong social bonds and community life, Western countries can draw lessons from the buffering role of these ties. Western societies, where affective well-being often depends on individual achievement and self-expression, may benefit from fostering greater community belonging and social support, thereby increasing satisfaction with one's place of living. Governments can pursue this through a strategic mix of social, physical, and civic policies. For example, investing in community spaces and infrastructure, or supporting neighbourhood associations, volunteering platforms, and local clubs such as sports, arts, and hobby groups that strengthen communal ties. Greater freedom to make life choices, coupled with lower barriers to participation in local decision-making, can reinforce feelings of belonging and control that are central to affective well-being. Policies that cultivate cohesive, liveable communities and encourage genuine connection can help reduce negative affect and promote more sustainable emotional well-being.

Several limitations warrant consideration. First, the analysis relies on GWP self-reports, which may reflect cultural or linguistic variation in how emotions and life evaluations are interpreted. Moreover, while the XGBoost–SHAP framework enhances interpretability, it remains correlational and cannot establish causal relationships between subjective and structural factors.

Future research could extend this agenda in several directions. Comparative studies might test whether similar affect-evaluation disconnects appear when using eudaimonic or flourishing measures, such as those in the Global Flourishing Database (VanderWeele et al., 2025). Longitudinal and multilevel designs could explore how

macro-level dynamics, such as economic shocks, governance reforms, or shifts in social cohesion, shape the PA–LE balance over time. Methodologically, hybrid models that combine machine learning with multilevel approaches could better capture both hierarchical data structures and non-linear effects. Finally, advancing the non-WEIRD research agenda requires integrating culturally grounded concepts of well-being and autonomy in African contexts, thereby enriching global theories of happiness and expanding the diversity of well-being metrics beyond Western-centric norms.

References

Adedeji, A., Olonisakin, T. T., Buchcik, J. et al. (2023). The multicultural conceptualisation of well-being. *BMC Public Health, 23*, 2041.

Addae, E. A., & Kühner, S. (2022). How Socioeconomic Status and Family Social Capital Matter for the Subjective Well-Being of Young People: Implications for the Child and Family Welfare Policy in Ghana. *Journal of Social Policy, 51*(4), 876–899.

Abdurrahim, Y., Ali, A. D., Sena, K., et al. (2020). Comparison of deep learning and traditional machine learning techniques for classification of pap smear images. *arXiv,* 2009.06366v1.

Baranski, E., Sweeny, K., Gardiner, G., et al. (2021). International optimism: Correlates and consequences of dispositional optimism across 61 countries. *Journal of Personality, 89*(2), 288-304.

Blanchflower, D., & Bryson, A. (2024). The Gender Well-Being Gap. *Social Indicators Research, 173*, 1–45.

Brulé, G., & Veenhoven, R. (2015). Geography of happiness: configurations of affective and cognitive appraisal of life across nations. *International Journal of Happiness and Development, 2*(2), 101-117.

Burger, M. J., & Pang, N. T. (2025). Editorial: Well-being in Asia. *Frontiers in Psychology, 16*, 1661988.

Calvo, R., Zheng, Y., Kumar, S., et al. (2012). Well-Being and Social Capital on Planet Earth: Cross-National Evidence from 142 Countries. *PLOS ONE, 7*(8), e42793.

Cantril, H. (1965). *The pattern of human concerns*. Rutgers University Press, New Brunswick.

Clark, A. E., & D'Ambrosio, C. (2018). Economic inequality and subjective well-being across the world. WIDER Working Paper Series wp-2018-170, World Institute for Development Economic Research (UNU-WIDER).

Cramm, J. M., Møller, V., & Nieboer, A. P. (2010). Improving Subjective Well-being of the Poor in the Eastern Cape. *Journal of Health Psychology, 15*(7), 1012–1019.

Deaton, A., Fortson, J. G., & Tortora, R. (2009). Life (Evaluation), Hiv/Aids, and Death in Africa. National Bureau of Economic Research Working Paper 14637. Available from https://www.nber.org/system/files/working_papers/w14637/w14637.pdf

De Boer, J. (2025). Life Satisfaction and Affect: Why Do these SWB Measures Correlate Differently with Material Goods and Freedom? *Review of Philosophy and Psychology, 16*, 137–152.

Diener, E., Diener, C., Choi, H., et al. (2018). Revisiting "Most People Are Happy"—And Discovering When They Are Not. *Perspectives on Psychological Science, 13*(2), 166-170.

Diener, E., Ng, W., Harter, J., et al. (2010). Wealth and happiness across the world: Material prosperity predicts life evaluation, whereas psychosocial prosperity predicts positive feeling. *Journal of Personality and Social Psychology, 99*(1), 52–61.

Ferrari, G. (2022). What is wellbeing for rural South African women? Textual analysis of focus group discussion transcripts and implications for programme design and evaluation. *Humanities and Social Sciences Communications, 9*(1), 1-15.

Graham, C., & Hoover, M. (2007). Optimism and poverty in Africa: Adaptation or a means to survival? Afrobarometer Working Paper, No. 76, November 2007. Available from https://www.afrobarometer.org/wp-content/uploads/2022/02/AfropaperNo76.pdf

Helliwell, J. F., Layard, R., Sachs, J. D., et al. (Eds.). (2025). *World Happiness Report 2025*. University of Oxford: Wellbeing Research Centre.

Ikuenobe, P. (2015). Relational autonomy, personhood, and African traditions. *Philosophy East and West*, *65*(4), 1005-1029.

Joshanloo, M. (2019). Cultural religiosity as the moderator of the relationship between affective experience and life satisfaction: A study in 147 countries. *Emotion, 19*(4), 629–636.

Joshanloo, M., & Bond, M. H. (2023). National wealth, individualism, generalised trust, and religiosity as moderators of the relationship between helping strangers and life satisfaction in 137 societies. *International Journal of Psychology, 58*(2), 178-186.

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *PNAS, 107*(38), 16489–16493.

Kaufman, M.B., Guest, A.M., Mmbaga, B.T., et al. (2022). What the World Happiness Report doesn't see: The sociocultural contours of wellbeing in northern Tanzania. *International Journal of Wellbeing, 12*(4), 27-50.

Knabe, A., Rätzel, S., Schöb, R., & Weimann, J. (2010). Dissatisfied with life but having a good day: time-use and well-being of the unemployed. *The Economic Journal*, *120*(547), 867-889.

Lambert, L., Lomas, T., van de Weijer, M. P., Passmore, H. A., Joshanloo, M., Harter, J., ... & Diener, E. (2020). Towards a greater global understanding of wellbeing: A proposal for a more inclusive measure. *International Journal of Wellbeing*, *10*(2).

Lundberg, S. M., & Lee, S. I. (2017). A unified approach to interpreting model predictions. In: Guyon I, Luxburg UV, Bengio S, Wallach H, Fergus R, Vishwanathan S, Garnett R (eds) Advances in neural information processing systems, vol 30. Curran Associates, Inc., Red Hook. https://proceedings.neurips.cc/paper/2017/file/8a20a8621978632d76c43dfd28b67767-Paper.pdf

Metz, T. (2011). Ubuntu as a moral theory and human rights in South Africa. *African Human Rights Law Journal*, *11*(2), 532-559.

Minkov, M. (2009). Predictors of Differences in Subjective Well-Being Across 97 Nations. *Cross-Cultural Research*, *43*(2), 152-179.

Ngamaba, K. H. (2016). Happiness and life satisfaction in Rwanda. *Journal of Psychology in Africa, 26*(5), 407–414.

Rishworth, A., Elliott, S. J., & Kangmennaang, J. (2019). Getting Old Well in Sub Saharan Africa: Exploring the Social and Structural Drivers of Subjective Wellbeing among Elderly Men and Women in Uganda. *International Journal of Environmental Research and Public Health, 17*(7), 2347.

Rojas, M., & Veenhoven, R. (2013). Contentment and Affect in the Estimation of Happiness. *Social Indicators Research, 110*, 415–431.

Rothman, I., & Veenhoven, R. (2013). Happiness in South Africa. Pattern of cheerful discontent. Available from https://optentia.co.za/files/other/happiness.pdf

VanderWeele, T. J., Johnson, B. R., Bialowolski, P. T., Bonhag, R., Bradshaw, M., Breedlove, T., ... & Yancey, G. (2025). The Global Flourishing Study: Study profile and initial results on flourishing. *Nature Mental Health*, 1-18.

Veenhoven, R. (1984). *Conditions of Happiness*. Springer, Dordrecht, Netherlands.

Veenhoven, R. (2000). The four qualities of life: Ordering concepts and measures of the good life. *Journal of Happiness Studies, 1*(1), 1–39.

Veenhoven, R. (2009). How do we assess how happy we are? Tenets, implications and tenability of three theories. In A.K. Dutt and B. Radcliff (Eds.): Happiness, Economics and Politics: Towards a Multi-disciplinary Approach, Edward Elgar Publishers, Cheltenham, pp.45–69.

Veenhoven, R., & Berg, M. (2013). Has modernisation gone too far? Modernity and happiness in 141 contemporary nations. *International Journal of Happiness and Development, 1*(2), 172-195.

White, S. C., & Jha, S. (2018). Towards an interdisciplinary approach to wellbeing: Life histories and Self-Determination Theory in rural Zambia. *Social Science & Medicine, 212*, 153-160.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*(2), 151.

Appendix A

Table A1. Definitions of variables

Variable	Question	Scale
Cantril ladder	'Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time? 0 is the worst possible life, and 10 is the best possible life for you	0-10
Affect balance	Positive affect-negative affect recalled to 0-10	
Positive affect	Average score of 5 items: Did you feel well-rested yesterday? (yes=1) Were you treated with respect all day yesterday? (yes=1) Did you smile or laugh a lot yesterday? (yes=1) Did you learn or do something interesting yesterday? (yes=1) Did you experience the following feelings during a lot of the day yesterday? How about enjoyment? (yes=1)	0-5
Negative affect	Average score of 5 items: Did you experience the following feelings during a lot of the day yesterday? How about physical pain? (yes=1) Did you experience the following feelings during a lot of the day yesterday? How about worry? (yes=1) Did you experience the following feelings during a lot of the day yesterday? How about sadness? (yes=1) Did you experience the following feelings during a lot of the day yesterday? How about stress? (yes=1) Did you experience the following feelings during a lot of the day yesterday? How about anger? (yes=1)	0-5

Poverty	Based on per capita income (reported annual household income divided by household size) and country-specific thresholds based on 2017 constant international dollars.	0=non-poor 1=poor
Age		Age in years
Gender		1=Male 2=Female
Immigrant	Were you born in this country, or not?	1=no; 0=yes
Lives in a rural area	The respondent's self-reported type of settlement.	1=Rural area or farm 2=Small town or village 3=Large city 4=Suburb of a large city
Education level	What is your highest completed level of education? Elementary: Completed elementary education or less (up to 8 years of basic education); Secondary: Completed secondary education and up to 3 years tertiary education (nine to 15 years of education); Tertiary: Completed 4 years of education beyond "high school" and/or received a 4-year college degree.	1=elementary 2=secondary 3=tertiary
Confidence in institutions	Average score of 4 items: Do you have confidence in each of the following, or not? How about the military? (yes=1) Do you have confidence in each of the following, or not? How about the judicial system and courts? (yes=1) Do you have confidence in each of the following, or not? How about the national government? (yes=1) Do you have confidence in each of the following, or not? How about the honesty of elections? (yes=1)	0-4
Health problems	Do you have any health problems that prevent you from doing any of the things people your age normally can do?	1=yes; 0=no

Table A2. Correlations between social capital variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Emotional social support	1.00									
2. Count on help	0.23	1.00								
3. Social media use	0.14	0.16	1.00							
4. Contacts with family/friends nearby	0.10	0.10	0.11	1.00						
5. Contacts colleagues/classmates	0.12	0.11	0.21	0.29	1.00					
6. Contacts neighbours	0.07	0.07	0.03	0.43	0.26	1.00				
7. Contacts shared interest groups	0.08	0.05	0.13	0.27	0.30	0.27	1.00			
8. Contacts strangers	0.05	0.05	0.14	0.19	0.27	0.21	0.28	1.00		
9. Social connectedness	0.37	0.12	0.07	0.12	011	0.12	0.08	0.03	1.00	
10. Loneliness	-0.09	-0.08	-0.02	-0.08	-0.04	-0.06	-0.03	0.03	-0.08	1.00

Table A3. Countries included in the analysis

Country	Classification (2022)	Number of observations
Benin	Lower-middle-income	969
Botswana	Upper-middle-income	964
Cameroon	Lower-middle-income	949
Chad	Lower-income	851
Comoros	Lower-middle-income	892
Congo, Rep.	Lower-middle-income	844
Congo, Dem. Rep.	Lower-income	914
Côte d'Ivoire	Lower-middle-income	955
Eswatini	Lower-middle-income	921
Gabon	Upper-middle-income	970
Gambia, The	Lower-income	896
Ghana	Lower-middle-income	940
Guinea	Lower-income	840
Kenya	Lower-middle-income	992
Lesotho	Lower-middle-income	892
Madagascar	Lower-income	915
Malawi	Lower-income	985
Mali	Lower-income	983
Mauritania	Lower-middle-income	910
Mauritius	Upper-middle-income	919
Mozambique	Lower-income	859
Namibia	Upper-middle-income	933
Niger	Lower-income	844
Nigeria	Lower-middle-income	976
Senegal	Lower-middle-income	903
Sierra Leone	Lower-income	881
South Africa	Upper-middle-income	937
Tanzania	Lower-middle-income	963

Togo	Lower-income	928
Uganda	Lower-income	959
Zambia	Lower-middle-income	968

Appendix B

Kenya

An analysis of Social Support Indicators of Wellbeing among Recovering Substance Use Disorder Patients in Kenya

1 Introduction

This section consists of the background, statement of the problem, research objectives, the justification of the study and the operational definition of variables.

1.1 Background

Research shows a positive correlation between social support and wellbeing (Aksoy et al, 2024; Liu et al, 2022; Lookatch et al, 2019; Thuku, 2022). In addition to higher wellbeing, strong social bonds predict future social support and direction during difficult periods (Jetten et al, 2012). However, the type and amount of social support needed varies with situations. Hence, when critical life events occur, it is easier for people with strong social bonds to make necessary lifestyle changes to cope with adverse circumstances (Tunçgenç et al, 2023). Many factors push and/or pull individuals into substance use including peer pressure, stress, curiosity, desire to escape from reality and negative role modeling (Attila et al., 2023; Bahr et al., 2021; Jouhki & Oksanen, 2021; Musyoka et al., 2020). However, as advanced by Social Bond Theory (Hirsch, 1969), strong attachment to significant others, involvement in pro-social activities, commitment to conventional social goals, and belief in validity of social values predict high levels of conformity to social norms and enhanced wellbeing. Although many studies on wellbeing have been conducted, few have analyzed the social needs of special populations during challenging times, and the social support needed to cope with different situations.

Special populations refer to groups that have common social, psychological, health or legal characteristics that may make them encounter barriers in obtaining appropriate treatment. These include older adults, people with disabilities and people suffering from substance use disorder (SUD), who usually experience inadequate access to

social, health and economic opportunities. According to Sussman et al (2020), special populations' needs are not fully addressed by traditional services delivery, hence tailored services must be provided to reduce inequities. Substance use disorder patients (SUDPs) are among the special populations whose needs are usually neglected in many societies who view them as deviant and rarely prioritize their wellbeing (Ventura et al, 2022). For instance, how we refer to individuals with SUDs determines whether we view them as deviants who should be punished, or patients who need care and support. While the quality of family social support influences the children's risk of initiation into substance use, relapse and negative effects (Atadokht et al, 2015; Li & Song, 2022; Mahsoon et al, 2023), Birkeland et al (2021) argues that negative social perception of SUDPs leads to low levels of support to affected family members. Yet, the impact of community perception of substance use on family support for members with SUD and the consequent effect on wellbeing is understudied.

As explained by Lardier et al (2017), youth with greater neighborhood sense of community are less influenced by negative environmental experiences and less likely to engage in substance use. According to social control theory by Hirschi (1969), strong bonds with family, friends, school, work, religion, and other social institutions motivate individuals to engage in responsible behavior and refrain from deviant pursuits including substance use. When these social bonds which encompass monitoring and directing behavior towards acceptable goals and pursuits weaken, individuals are less likely to adhere to conventional standards and may engage in unacceptable behavior, such as substance use (Moos, 2007). Weak attachments to existing social standards may be caused by inadequate shaping of behavior by families that lack cohesion, friends who advance deviant values and lack of supervision and vigilance in school and other relevant social institutions. However, despite numerous studies relating social capital and wellbeing in everyday life (Isham et al, 2020), there is inadequate research from the African context on how strength of social bonds reduces risk of initiation into substance use and promotes recovery and wellbeing among SUDPs.

Among Africans, community embeddedness of individuals is an integral characteristic, where individual, family, and community wellbeing are intricately interwoven (Khumalo et al, 2021). Due to social changes resulting from modernization and globalization, emerging issues such as substance use are on the increase, threatening individual and community wellbeing. In Kenya, the National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA, 2021) established that despite the increasing awareness of the negative effects of substance use and putting in place the necessary legal and institutional frameworks to address substance use, new psychoactive substances have emerged, as consumption of traditional drugs of abuse continues. In 2011, excessive and unhealthy consumption of alcoholic drinks emerged as a major hindrance to the health, social and economic development of the Kenyan people (NACADA, 2011). A study by NACADA (2022) showed that the minimum age of initiation into drugs of abuse was 6 years, and the average age category was 16–20 years. While 12.5% of Kenyans aged 12-65 years engaged in alcohol drinking by 2022 (Kinyanjui, 2023), further research shows that up to 0.05% of Kenyans aged 15-65 suffer from severe SUD. Research points to a gendered perspective where more males than females abuse drugs at approximately 89% and 11% respectively (Tamara et al, 2023). According to the United Nations Office on Drugs and Crime (UNODC, 2023; 2009), because of the negative consequences of substance use, many community members negatively label SUDPs, making it challenging for them to seek help when in distress. Bahl et al (2022), explains that supportive and motivating community relationships are important components during recovery. However, despite the high relapse rates (Kuyeya, 2021), limited research on the relationship between social support and wellbeing of SUDPs has been conducted in Kenya.

Research by NACADA (2021) found emerging trends of substance use to be widely spread across various counties in Kenya. However, the central region was found to have the highest prevalence of potable spirits and tobacco use, third highest prevalence of multiple prescription drugs use and third highest increase in the number of children taking alcohol (NACADA, 2022). Since most SUDPs get initiated into drugs as minors (Mahsoon et al, 2023; NACADA, 2022), a thorough examination of factors that make it challenging to stop once initiated, and those that promote recovery and

wellbeing is critical for formulation of effective interventions. Furthermore, considering that social support is a strong predictor of wellbeing (Aksoy et al, 2024; Liu et al, 2022; Lookatch et al, 2019; Thuku, 2022), and negative labelling of SUDPs by community members has been established as a hindrance to recovery (UNODC, 2023; 2009), an analysis of social support influence on wellbeing of SUDPs may be crucial to the formulation of a substance use prevention and management framework that is customizable to different social settings. According to Muller et al (2017), participating in a social network that is supportive of recovery is associated with treatment completion, greater abstinence, and greater wellbeing. However, limited research exists on the social support indicators of wellbeing at various stages of the SUDPs' initiation into drugs, progression into addiction, and the recovery phase in Kenya, hence the need for more research.

1.2 Statement of the problem

Substance use is a global challenge that threatens the future of societies. Due to social changes resulting from modernization and globalization, the population of individuals suffering from SUD has increased leading to adverse effects on the wellbeing of affected individuals, their families and communities. In Kenya, excessive and unhealthy consumption of substances have emerged as a major hindrance to the social-economic development and wellbeing of the people. To address substance use, the government of Kenya has put in place the necessary legal and institutional frameworks, and stakeholders have enhanced public sensitization on the negative effects of substance use. Yet, new psychoactive substances have emerged, as consumption of existing drugs of abuse continues. This implies that current strategies are either ineffective or inadequate, thus calling for new measures.

Considering the positive correlation between social support and wellbeing, and the existence of negative labelling of SUDPs by community members, an analysis of the social support indicators of wellbeing among SUDPs may be crucial to the formulation of a substance use prevention and management framework that could be customized to different social-cultural settings. Such a model could be used among school children to prevent early initiation into drugs as well as encourage those already initiated to stop

using. The model would be crucial in enhancing the wellbeing of SUDPs thus reducing their dependence on substances during treatment and recovery stages. To enhance effectiveness, such a framework should draw best practices from the experiences of those who are successfully recovering from substance use. Many studies have focused on SUDPs in rehabilitation centres, with very few examining their recovery journey within the community, and the role of social support on their wellbeing. Currently, limited studies have analyzed the social support indicators of wellbeing at various stages of the SUDPs' initiation into drugs, progression into addiction, and during recovery, that could guide in the formulation of substance use prevention and management framework in Kenya, hence the need for this study.

1.3 Objectives

The purpose of this study was to analyze the social support indicators of wellbeing among recovering substance use disorder patients (SUDPs) in Kenya. While many studies have established the positive relationship between social support and wellbeing, there is limited research on the social needs that drive individuals into substance use and the social support predictors of wellbeing among SUDPs in Kenya. Owing to the increasing incidences of substance use among the economically productive age groups leading to low wellbeing and productivity, this study was crucial to the formulation of a substance use prevention and management framework that can be customized to different social-cultural settings to address substance use in the country. The following specific objectives guided the study. To:

i. Analyze the factors that push or pull individuals into substance use.
ii. Examine factors that reinforce the commitment to stay drug-free
iii. Isolate the social support needs at different stages of the substance users' journey from initiation to the recovery phase
iv. Assess the level of perceived social support and wellbeing of recovering SUDPs
v. Evaluate the relationship between social support and wellbeing of recovering SUDPs

1.4 Justification of the study

According to Sussman et al (2020), the needs of special populations are not fully addressed by traditional services delivery, hence tailored services must be provided to reduce inequities. This is only possible if studies are conducted to establish the specific needs of special populations and how services can be tailored to meet the identified needs. SUDPs are among those special populations whose needs are usually neglected in many societies (Ventura et al, 2022), including Kenya where they are usually viewed as deviants and their wellbeing rarely prioritized.

A study by NACADA (2022) showed that the minimum age of initiation into drugs of abuse in Kenya is 6 years, that 12.5% of Kenyans aged 12-65 years engage in alcohol drinking and that about 0.05% of Kenyans suffer from severe SUD. These statistics are worrying, and urgent interventions are critical considering that unhealthy consumption of substances already emerged as a major hindrance to the health, social-economic development and wellbeing of Kenyans (NACADA, 2011). Bearing in mind that substance use is rampant among the economically productive age groups and SUD leads to low wellbeing and reduced socio-economic productivity, empirical data is crucial to the formulation of substance use prevention and management framework to address substance use in the country, hence the need for this study.

1.5 Operational definition of variables

Drug: A drug is any chemical entity or mixture of entities, other than those required for the maintenance of normal health, which is largely abused for the psychoactive effects including alcohol, tobacco, glue and prescription drugs among others.

Social support: This refers to the perception and actuality that one is valued, understood, and cared for by other people in their social network.

Perceived social support: This refers to how much a person feels loved and cared for by his/her social network, including the belief of having a reliable network to turn to when needed.

Substance: This refers to any chemical material, including those not intended for human consumption that are abused for their psychoactive effects eg glue or paint thinners. For purposes of this study, all drugs are substances.

Substance Use: This refers to the continued use of substances for their psychoactive effects, in a way that is detrimental to self, society, or both.

Substance Use Disorder (SUD): This is a treatable (but incurable) mental disorder that affects a person's brain and behavior, leading to one's inability to control their use of substances to which they have become dependent on/addicted to.

Substance Use Disorder Patients (SUDPs): These are individuals who are currently undergoing treatment for SUD.

Recovering Substance Use Disorder Patients: These are individuals who have already undergone treatment for SUD in a Rehabilitation Centre and have managed to stay drug-free for at least two months within the community.

Wellbeing: This is a multi-dimensional construct referring to how satisfied one is with life in general, and the various important aspects of one's life including health, financial, psychological, social and spiritual among others.

Muratina: This is a traditional alcoholic drink that holds significant cultural importance among the Kikuyu people of Kenya.

2 Research Methodology

This is a cross-sectional study utilizing a mixed methods approach to collect and analyze data on the 'Social Support indicators of Wellbeing among Recovering Substance Use Disorder Patients in Kenya'.

2.1 Site selection

The Central Region of Kenya was Purposive selected owing to the high prevalence of potable spirits and tobacco use, multiple prescription drugs consumption, and increase in the number of children taking alcohol (NACADA, 2022). Kenya has a total of eight regions (previously known as provinces) that are divided into 47 sub-counties. The regions are Central, Rift-Valley, Eastern, Western, North-Eastern, Nyanza, Coast and Nairobi. The Central Region (study site) has five counties namely, Nyeri, murang'a, Kiambu, Kirinyaga and Nyandarua.

2.2 Target population and sample size

All the 5 counties in the Central Region (Nyeri, murang'a, Kiambu, Kirinyaga, and Nyandarua) were included in the study.

Due to unavailability of a database on recovering SUDPs in the region and the country at large, snowball sampling was utilized to reach potential respondents. The initial respondents were identified through contacting the Drug Addiction Rehabilitation Centres in the region and Social Support Groups (SSGs) such as Alcoholic Anonymous who referred the research team to their recovering members who were willing to participate in the study. To qualify, a recovering SUDP must have stayed drug free for at least two months prior to the study and be a resident of Central Kenya.

To avoid going against confidentiality issues, the research team worked closely with the social support group (SSG) leaders and Rehabilitation Centre managers (RCMs). Snowball sampling continued until the level of saturation was achieved in each county and no more potential respondents were available.

2.3 Data collection instruments

Interview schedules (ISs), interview guides (IGs) and Focus Group Discussion (FGD) Guides were used in data collection. ISs with both closed and open-ended questions collected quantitative data from respondents. Instead of questionnaires, ISs were preferred as they allowed research assistants to translate the questions to the local languages for respondents who had challenges understanding the English language (with Kiswahili translation) used in the data collection tools (sub-appendix B1-B3)

The ISs had three (3) sections such that **Section A** collected data on sociodemographic characteristics, **Section B** had short answer questions, while **Section C** collected social support and wellbeing data at Likert Scale.

Social support was measured using 'The Multidimensional Scale of Perceived Social Support (MSPSS), due to its good internal and test-retest reliability, validity, and a stable factorial structure across populations (Zimet et al, 1988). The MSPSS assesses perceptions of social support adequacy from family, friends and significant others, making it very relevant to SUDPs who are struggling to get re-accepted in the family,

society and social networks that may have shunned them during the time of addiction. The 12-item scale uses a 7-point Likert-type response format (1= very strongly disagree; 7= very strongly agree) where each of the three subscales (i.e., family, friends, significant other) is assessed with four items.

Wellbeing was measured using the 'Personal Wellbeing Index (PWI)' which has demonstrated good psychometric performance in terms of its reliability, validity and sensitivity across cultures (International Wellbeing Group, 2013; International Wellbeing Group, 2024; Yiengprugsawan et al, 2010).

The IGs and FGD guides were developed using the five-step process as explained by Yaakop et al (2023). Translation of IG and FGD questions to Kiswahili and local language (when necessary) was done to ensure that key informants and FGD participants who did not clearly understand English were interviewed in the language they were most comfortable with, to enhance understanding.

2.4 Pilot study

The pilot study was preceded by training of research assistants. It was conducted in Laikipia County in the Rift Valley Region, neighbouring the Central Region. In addition to testing the reliability and validity of the data collection instruments, piloting also provided an opportunity for research assistants to familiarize themselves with the tools.

Cronbach's alpha tested the internal consistency (reliability) of items in the Likert Scale while Exploratory Factor Analysis (EFA) evaluated the structural soundness of the constructs (validity). The reliability tests established good reliability (α=0.854 for the MSPSS; α=0.861 for the PWI).

The Validity results for the MSPSS (KMO = 0.674; Bartlett's $p < 0.05$) indicated acceptable validity. However, the validity results for the PWI (KMO = 0.540; Bartlett's $p < 0.05$) implied that the items required rephrasing to suit the local context as KMO was slightly below the generally acceptable threshold of 0.6. Although the results were expected to improve with the larger sample during field work, the pilot study findings guided the revisions done to enhance clarity of the questions in the data collection

tools (particularly the PWI) before the actual field study was conducted. Translations were also carefully reviewed to ensure they captured the context.

2.5 Data collection procedure

The initial respondents were contacted through their social support group leaders and/or substance use rehabilitation centres that they are attached to. An appointment was then booked for consent seeking and structured interview using ISs.

IGs collected qualitative data from social support group leaders and substance use rehabilitation centre managers on community perception of SUDPs, available social support networks for recovering SUDPs, and the effect of social support on recovery, wellbeing and productivity of SUDPs.

The FGD guides collected data from FGD participants. Three FGDs with 6-12 participants were conducted: one for male participants, another for female, and another for both male and female representing the five (5) counties of study (Central Kenya). The FGDs collected subjective views from participants on social support needs during various phases of their substance use journey, right from initiation into drug use to the current recovery phase. Data on social support received, challenges faced, lessons learned and the role of social support on the recovery and wellbeing of substance users at different stages were collected.

2.6 Data analysis

Quantitative data was analyzed both descriptively and inferentially. Social support was computed by adding all the scores attained after administering 'The Multidimensional Scale of Perceived Social Support (MSPSS) to each respondent. Individuals were considered as being adequately social supported if they scored more than half of the total expected score.

Wellbeing was computed by adding all the scores attained after administering the 'Personal Wellbeing Index (PWI). Individuals who scored less than half of the total expected score were considered to have low wellbeing.

The variables 'Social support' and 'Wellbeing' were subjected to a correlation analysis to test whether they were significantly related. A regression analysis was then conducted to establish the social support and socio-demographic predictors of wellbeing.

Qualitative data was analyzed thematically in line with research objectives, and the findings triangulated with the quantitative ones to provide deeper subjective insights.

After preliminary data analysis, the draft research findings were presented at a stakeholders' validation workshop for scrutiny and further input before preparation of the final report.

2.7 Ethical considerations

Before commencement of data collection, the research proposal underwent ethics approval, after which a research permit was sought from The National Commission for Science Technology and Innovation (NACOSTI). In addition, both written and/or oral consent were sought from each respondent, key informant and FGD Participant before interviews are conducted. Confidentiality and anonymity were strictly observed, and respondents assured that they could choose not to participate and/or opt out at any stage, if they so wished.

3 Presentation of the research findings

This section presents the research findings organized in line with research objectives. Data was collected from 323 respondents, 6 key informants and 3 FGDs in Central Kenya.

3.1 Socio-demographic characteristics of respondents

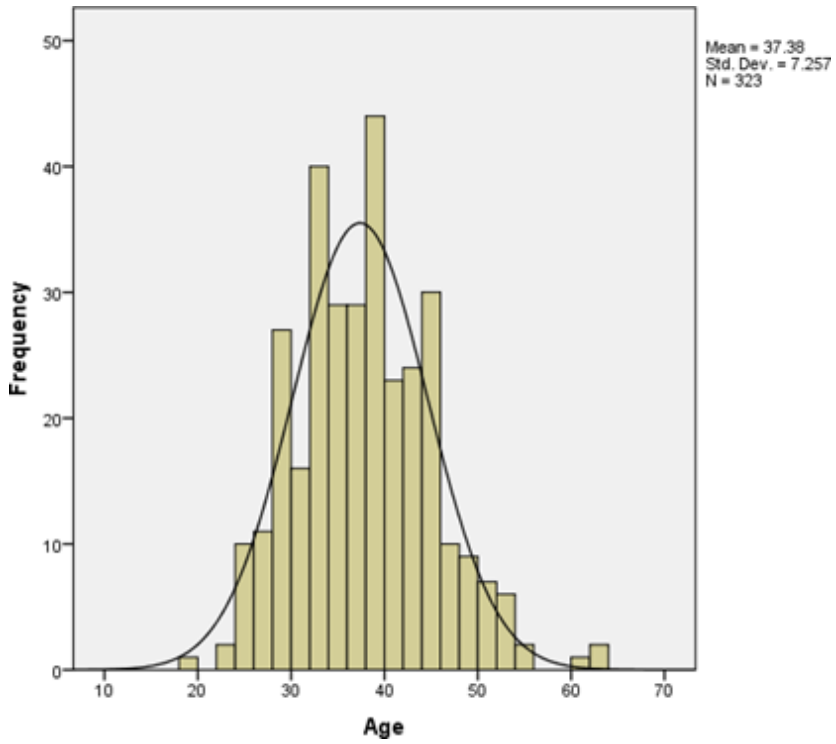
This sub-section presents respondents' data on the county of residence, age, gender, marital status, education and income. In terms of county of residence, respondents were unevenly distributed across the five counties of central Kenya as shown in Table 1.

Table 1. Distribution of respondents by county of residence

	Frequency	Percent	Cumulative Percent
Nyandarua	51	15.8	15.8
Nyeri	82	25.4	41.2
Kirinyaga	30	9.3	50.5
Murang'a	65	20.1	70.6
Kiambu	95	29.4	100.0
Total	323	100.0	

As Table 1 shows, the highest percentage of respondents were from Kiambu (29.4%), followed by Nyeri (25.5%), Murang'a (20.1%), Nyandarua (15.8%) and Kirinyaga (9.3%). However, considering there was no database on the population of people with and /or recovering from SUD per county or nationally, these percentages only show the number of recovering individuals who participated in the study but may not necessarily reflect the population characteristics in the study counties. Hence, the data can only be useful as a baseline for future studies. The age distribution of the respondents is shown in Figure 1.

Figure 1. Distribution of respondents by age



As Figure 1 shows, the mean age was 37.38 years, with a standard deviation of 7.26. Only 0.3% of the respondents were aged below 20 years, and 0.9% were over 60 years implying that majority may have been struggling with SUD at a young adult age when they should have been socio-economically productive. The other socio-demographic characteristics including gender, marital status, education, form of employment and income level are presented in Table 2.

Table 2. Distribution of respondents by socio-demographic characteristics

Variable	Value		Frequency	Percent	Cumulative Percent
Gender	Male		260	80.5	80.5
	Female		63	19.5	100.0
	Total		323	100.0	
Marital Status	Married		145	44.9	44.9
	Single (Never Married)		88	27.2	72.1
	Separated		82	25.4	97.5
	Divorced		8	2.5	100.0
	Total		323	100.0	
Education Level	None		2	.6	.6
	Primary School		42	13.0	13.6
	Secondary School		104	32.2	45.8
	Middle Level College		91	28.2	74.0
	Undergraduate Degree		74	22.9	96.9
	Postgraduate Degree		10	3.1	100.0
	Total		323	100.0	
Form of Employment	Self-employment		172	53.3	53.3
	Formal employment		98	30.3	83.6
	Informal employment		36	11.1	94.7
	Casual Labour		5	1.5	96.3
	Unemployment		12	3.7	100.0
	Total		323	100.0	
Average Monthly Income	KES	EUR			
	Below 10,000	Below 66.67	25	7.7	7.7
	10,000- 20,000	66.67-133.33	104	32.2	39.9
	20,001- 40,000	133.34-266.67	121	37.5	77.4
	40,001- 80,000		50	15.5	92.9
	Above 80,000	266.68-533.33	23	7.1	100.0
		Above 533.33			
Total			323	100.0	

According to Table 2, the gender distribution was skewed with 80.5% of respondents being male, and 19.5% female. This corresponds to the general Kenyan situation where

more male than female reportedly using drugs hence more male would be expected to be on recovery.

An analysis on marital status showed that a higher percentage of married people (44.9%) were recovering from substance use compared to the other marital categories. As Table 2 shows, the married respondents were almost half (44.9%) of the other categories combined namely, Single (Never Married) at 27.2%, Separated (25.4%) and divorced (2.5%). Based on the statistics, more than a quarter (27.9%) of the respondents were separated or divorced, probably an indication of the negative effect of substance use on marriage, despite the respondents being on recovery. None of the respondents were widowed, implying that in case any widowed individuals suffered from SUD, they either did not seek help hence were not on recovery journey or were unwilling to participate in the study. The higher percentage of married individuals who are recovering successfully could be attributed to the social support from spouses, which all the other categories lacked.

The analysis of respondents' level of formal education attained showed that 0.6% had never been to school, but more than half had post-secondary education with 25% having university degrees. This shows that the respondents generally possessed satisfactory literacy levels and majority were skilled as evidenced by the 28.2% who went up to Middle Level College, 22.9% with undergraduate degrees and 3.1% with Postgraduate Degrees.

In terms of employment, 53.3% of the respondents were self-employed while the others were in formal employment (30.3%), informal employment (11.1%) and casual labour (1.5%). About 3.7% were unemployed at the time of the study. An analysis of respondents' income as presented in Table 3.2 shows extremely low levels of income with almost 75% of the respondents earning below 267 Euros (KES 40,000.00) monthly. Only 7.1% earned more than €533.00 (above KES 80,000.00), implying that the levels of education may not have translated to adequate income for majority of the respondents. Considering that most respondents were well educated, largely engaged in self-employment, but earned low incomes, the study conducted a correlation test to

establish whether the level of education and income were significantly related. The results are presented in Table 3.

Table 3. Correlation test between education and income

		Education Level	Average Income
Spearman's Rho	Education Level	Correlation Coefficient Sig. (2-tailed) N	1.000 . 323
	Average Income	Correlation Coefficient Sig. (2-tailed) N	.524** .000 323

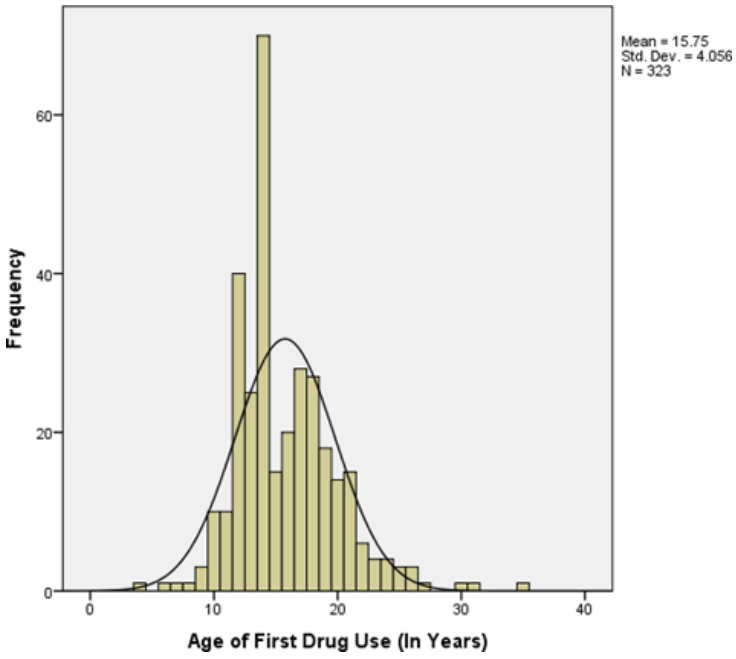
** Correlation is significant at the 0.01 level (2-tailed).

The correlation test results in Table 3 show a significant positive relationship between education and income (r_s=0.524, p<0.001) implying that despite the average monthly income being low for most respondents, those with advanced education generally earned more than the rest.

3.2 Factors that push or pull individuals into substance use

People get into substance use by being pulled (attracted to it) or being pushed (escaping from something else) for many reasons. The findings of this study show that the youngest age of initiation into drugs was 4 years, as shown in Figure 2.

Figure 2. Distribution of respondents by age of drug initiation



As Figure 2 shows, 0.3% of the respondents were initiated into drugs at only 4 years of age, 2.2% started using before they were 10 years, and the mode age was 14 years. The mean age of initiation into drugs was 15.75 years with a standard deviation of 4.1, implying that 11-19 years was the average age category for initiation. A few (0.9%) got initiated after age 30 but still developed the SUD from which they were recovering, implying that nobody is too old to get addicted. According to the study, the reason for initiation, the person responsible, and the main drug of initiation varied as shown in Table 4.

Table 4. Push and pull factors associated with substance use initiation

Variable	Value	Frequency	Percent	Cumulative Percent
What was the reason for initial drug use?	Peer Pressure	194	60.1	60.1
	Stress	15	4.6	64.7
	Curiosity	109	33.7	98.5
	Other	5	1.5	100.0
Who was responsible for the initial drug use?	Parent	8	2.5	2.5
	Sibling	92	28.5	31.0
	Other Relative	20	6.2	37.2
	Friend	196	60.7	97.8
	Others	7	2.2	100.0
	Alcohol	266	82.4	82.4

Which was the main drug of initiation?	Tobacco	24	7.4	89.8
	Marijuana	18	5.6	95.4
	Miraa	11	3.4	98.8
	Prescription drugs	2	.6	99.4
	Others	2	.6	100.0
	Total	323	100.0	

As shown in Table 4, peer pressure was the main reason for initiation into drugs by majority of the respondents (60.1%), followed by curiosity (33.7%) and stress (4.6%). As quoted from one FGD participant (FGD2),

> '….. I was from a controlling environment in our home. When I finished Class 8 and was heading to Form 1, I found a lot more freedom. There was bullying in high school during my time, so I found a group of boys from my home area. Because I did not want to be bullied, I hung out with those guys who were older than me, from my hometown. Those students would smoke and drink. That is how I found myself addicted.'

The findings show that while majority of the respondents were introduced to drugs by friends (60.7%), many got initiated through family members, mainly siblings (28.5%), parents (2.5%), and other relatives (6.2%). As pointed out by FGD4,

> '…. I got my first sip of alcohol from my father. He always had a gourd of muratina (traditional brew) in his house and whenever I did something to make him proud of me, he would give me a sip. By the time I completed my primary school, I was already addicted….'

Other relatives included grandparents, uncles and cousins who contributed to the vice mainly by sending their young kin to purchase cigarettes and tobacco for them in local shops, thus arousing their curiosity. The main drug of initiation was alcohol as reported by 82.4% of the respondents, followed by tobacco (7.4%), marijuana (5.6%), miraa (3.4%) and prescription drugs (0.6%), indicating that social factors associated with the home environment could be closely connected to drug initiation, particularly in children. Having established the factors that led to drug initiation, the study sought to find out what motivated the respondents to make the decision to stop using drugs and stay drug free for the period that they had managed by the time of study.

3.3 Factors that motivated respondents to stay drug free

The factors that motivated the respondents to make the decision to abstain from drugs and those that reinforced the commitment are shown in Figure 3.

Figure 3. Factors that motivated respondents to abstain from drugs

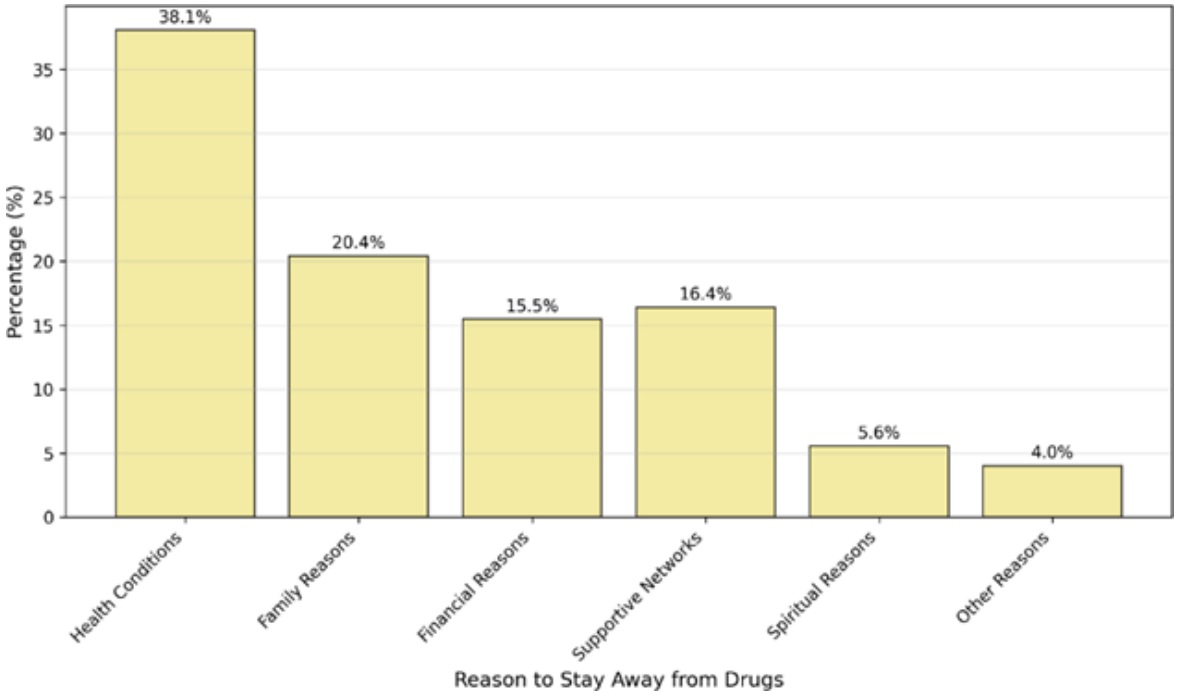


Figure 3 shows that 38.1% of the respondents were pressured to keep away from drugs to enable management of life-threatening health conditions which had worsened with continued drug use. Others were motivated by family reasons (20.4%) where continued use of drugs threatened valued family relations. Quoting FGD12,

> '…. I come from a close family who had been urging me to stop drinking for a long time. After my doctor told me that if I didn't stop, my health condition would be critical, a family member who was recovering successfully after going through the Alcoholic Anonymous (AA) process introduced me to AA and has been supporting during recovery….'

Newly established supportive networks with people who supported the respondents to abstain were also reported as motivating factors by 16.4%. In addition, financial reasons were reported by about 15.5% of the respondents who explained that their financial debts had risen to unsustainable levels. As reported by FGD11,

> '… My family had been encouraging me to abstain for a long time unsuccessfully. The last straw was when I was paying farm workers' wages via M-Pesa and I must have accidentally added an extra zero and sent more money than I should have. The next day, after the binge, I looked at my

> account and could not believe that I had paid KES 50,000.00 instead of KES 5,000.00. I made my final decision then and have never gone back to alcohol…'

About 5.6% of the respondents abstained due to spiritual reasons that gave hope after they had lost everything and hit rock bottom due to substance use. Quoting FGD9,

> '…Mine came from a point of hopelessness. I felt that I had been bright, had people in my life who were willing to support me, and I was at a point where I felt I had wasted so much and I just needed a change…."

Responding to the question on how drug use had affected various aspects of their wellbeing, 96.0% of the respondents reported that their psychological wellbeing had been negatively impacted, while social relations with family were negatively affected for 96.9%. In addition, 94.1% reported that social relationships with friends had been ruined, while 93.8% indicated that social relations with other members of society were negatively affected. The financial aspect was the most affected, with 97.8% of the respondents reporting negative effects. Health and spiritual impact were negative for 96.6% and 95.7% of respondents respectively. The findings imply that drug use had adversely affected all dimensions of wellbeing for majority of the respondents hence reinforcing their commitment to stay drug free despite the challenges experienced.

3.4 Social support needs of substance users at different stages

Since human beings are naturally social, social support was needed at all stages of the respondents' lives. From the findings, social support needs may vary from stage to stage but the main sources of support remained family, friends and significant others in community. During recovery, 73.4% of respondents still felt that they needed more social support than they were receiving, hence the need to examine the social support needs at the various stages of the journey, and the social networks who are expected to offer it. The next subsections 3.4.1, 3.4.2 and 3.4.3 assess the social support needs mainly from the subjective views of key informants and the FGD participants.

3.4.1 Social support in prevention of early initiation into drugs

The views gathered from key informants and FGD participants showed that although the decision to stay drug-free was largely personal, social support gave respondents the motivation to keep away from drugs despite temptations and peer pressure. At

various stages of the substance use journey, the level of social support influenced the risk of getting initiated to drugs, continued use after initiation, the motivation to stop, and the chances of relapse during recovery.

During initiation into drugs, social support from family, friends and community were reported as necessary to prevent the young people from getting into drug use. At family level, regular conversations at home about the negative consequences of drug use, respectful relationships within the family to prevent feelings of neglect, and positive role modeling were cited as preventive. Families in which alcohol-taking was part of adult celebrations created fertile ground for children to get initiated into drinking. Some male FGD participants narrated how their fathers or grandfathers would reward them with sips of the local traditional brew (muratina) whenever they were obedient or made them proud as young boys, making them associate alcohol with success.

To reduce the chances of initiation into drugs at young ages, key informants and FGD participants felt that there was need for community members to provide safe environments that are free from drugs, especially for children. Community members were urged to listen to young people's concerns without dismissing them and to be positive role models for the young generation.

It was recommended that friends and significant others should encourage sober peer behaviour rather than pressure their friends to "fit in" through taking drugs. Sensitization was hailed as a crucial way of creating awareness among young people to avoid being misled by those who normalize/glorify drug use. In case of females, most were introduced by male friends especially boyfriends. The female FGD participants explained that courtship included going for outings where alcohol drinking was encouraged by the male partners and 'cool girls' were expected to drink. As FGD1 pointed out,

> 'I wanted a boyfriend. I needed someone to love me. So, I did whatever I could so that I can be with the guy. Although I did not like the taste of beer initially, I took it to avoid disappointing my boyfriend. Later, I started enjoying the feeling'

However, as parents, women carry heavier caregiving and household responsibilities where the additional social pressure of parenting under constrained financial resources pushed some women deeper into drug use to escape the harsh reality.

3.4.2 Role of social support in reducing continued use of drugs after initiation

To reduce the risk of continued use of drugs after initiation, FGD participants felt that families could assist by resolving family disputes and reduce sources of stress that usually push individuals deeper into drug use. In addition, keeping young people constructively engaged with relevant activities, and offering emotional support in times of distress would reduce the push factors. Feeling supported and held accountable by family members was reported as a motivating factor for abstinence.

The FGD participants identified the need for community members to reduce the stigma associated with drug addiction by supporting rather than judging those using drugs. Communities were urged to create supportive community programmes that provide alternatives including skills training, recreation and counselling to those who had drug-related challenges. It was challenging to abstain from drugs when family and community members continued labelling as explained by FGDF7 who said,

> '…When I go home, I could hear my sisters and community members discussing amongst themselves on whether I had stopped alcohol abuse…'

According to the key informants and FGD participants, the social support needed from friends and significant others was in form of encouraging those using drugs to adopt healthier coping mechanisms particularly during stressful times. Friends were required to assist by steering their affected friends away from drug-using networks and offering supportive companionship.

3.4.3 Social support needs during recovery

To reduce chances of relapse, FGD participants emphasized the need for family members to support those in recovery by including them in meaningful socio-economic activities. The family was urged to provide consistent monitoring and encouragement while empathizing with the recovering members. Engaging in open,

honest communication and reducing opportunities for solitude was regarded as crucial avenues of motivating those in recovery to maintain sobriety.

FGD participants regarded the community as responsible for building social environments where recovering individuals are not stigmatized. As much as possible, key informants felt that it was the role of the community to provide safe spaces, and opportunities for those on recovery to reintegrate back into productive community life. Special consideration was needed for women who according to FGDF1,

> 'In my experience, women are not expected to be in recovery because they are not expected to drink in the African society. And so, they are stigmatized and are unable to share or even access some of the recovery facilities or opportunities that can help them get better or deal with their drug problems….'

According to majority of the FGD participants, friends and significant others should take up the supportive role of ensuring that those recovering are assisted to form new friendships that support sobriety, while distancing from old ones who reminded them of drug use. Whenever possible, friends and acquaintances on a successful recovery journey should be encouraged to play a mentorship role. Helping to redirect the focus of those recovering towards healthier goals was highlighted as an important form of support that friends should provide to reduce chances of relapse. According to FGDF3,

> 'Social Support groups create a safe space amongst peers where each gets to meet people who have gone through similar experiences hence show acceptance, grace, and understanding which helps the new ones. Acceptance leads to assisting others who may be going through similar experiences even when they may not necessarily understand what they are going through. It helps them understand that drug addiction is a disease that needs expert care….'

The FGD participants pointed out the differences in gender experiences where society judges the females more harshly than male for taking drugs hence discouraging women from seeking drug-related help due to the associated stigma. Considering this, customized support is needed for women during recovery to assist them regain their lost self-esteem since 'substance use in women is often associated with prostitution hence female SUDPs are viewed as cheap and of low moral standards.'

Key informants noted that during treatment and recovery, female SUDPs sometimes faced the challenge of sexual exploitation either within or outside the treatment

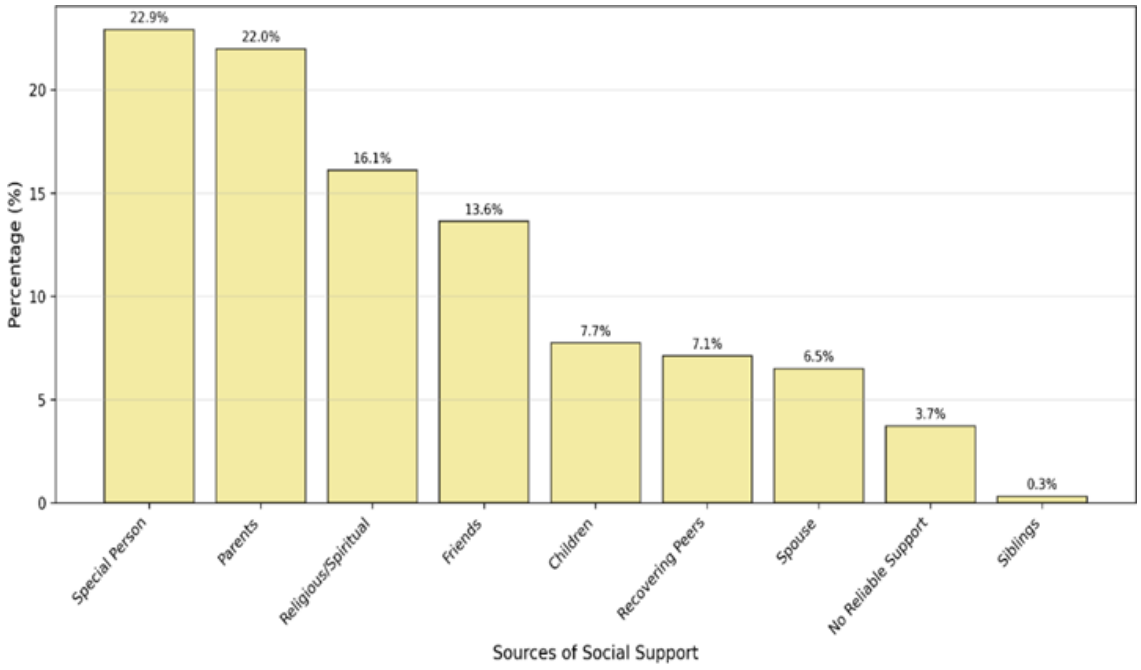
programme which interfered with the recovery process. Due to the scarcity of gender-specific support spaces, women find it challenging to seek help and openly share their experiences hence the low number of female clients in treatment and recovery programmes. As narrated by FGDF6,

> '…. when women are going through recovery in rehabilitation centers or in the AA program, men who are more experienced in the programme sometimes take advantage of the women….'

3.5 Level of social support

In assessing the social support available to respondents, each was required to list his/her major source of social support during the recovery journey as shown in Figure 4.

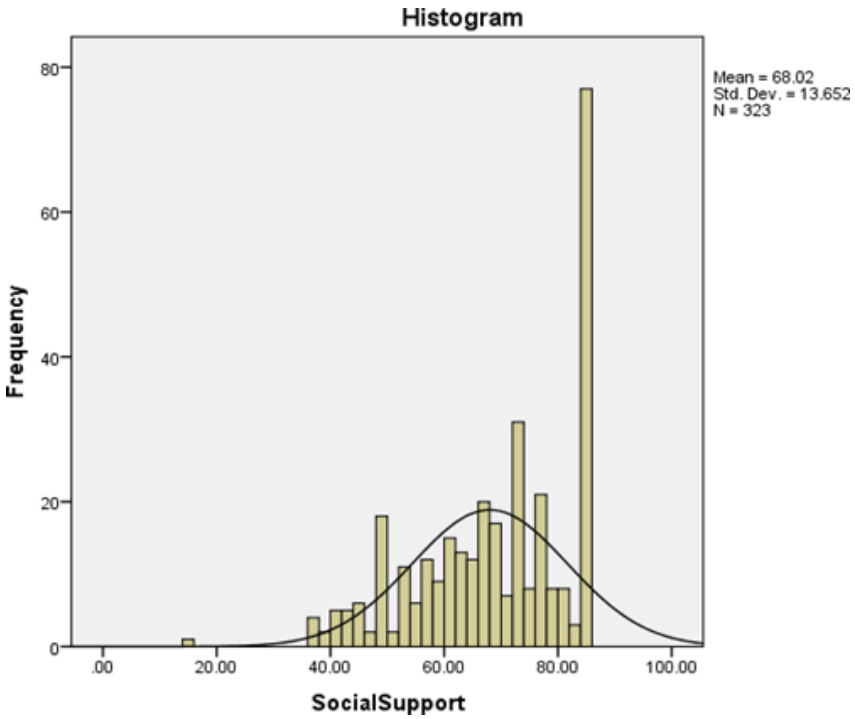
Figure 4. Distribution of respondents by major source of social support



From the results in Figure 4, recovering peers were cited as the major source of social support by the highest percentage of respondents (22.9%), followed by parents (22%) and spouses (16.1%), However, 3.7% had no social support that they could consider reliable. Further analysis showed that the family (parents, siblings, offsprings, spouse) was regarded as the major support system by almost half (44.9%) of the respondents, with parents being the major support not only for younger respondents, but also some older ones.

To analyze the level of social support for respondents, the MSPSS was administered due to its good internal and test-retest reliability, validity, and a stable factorial structure across populations (Zimet et al, 1988). The scale measures perceived social support from family, friends and significant other/special person. The variable 'Social support' was computed by adding all the scores attained by each respondent as shown in Figure 5.

Figure 5. Distribution of respondents by level of social support



The findings in Figure 5 reflect a sample with negatively skewed social support scores implying that majority of the respondents experience adequate social support. Out of the expected maximum score of 84, only 3.7% scored less than half (below 42), with 23.8% attaining the maximum score of 84. While the high scores may be surprising, they should not be unexpected considering that most respondents were referred through snowball by their social support group contacts. Considering the positive relationship between social support and wellbeing, the respondents' level of wellbeing was analyzed.

3.6 Respondents' level of wellbeing

Wellbeing of Respondents was measured using the PWI which has demonstrated good psychometric performance in terms of its reliability, validity and sensitivity across cultures (International Wellbeing Group, 2013; Yiengprugsawan et al, 2010). The variable 'Wellbeing' was computed by adding all the scores attained by each respondent, as shown in Figure 6.

Figure 6. Distribution of respondents by level of wellbeing

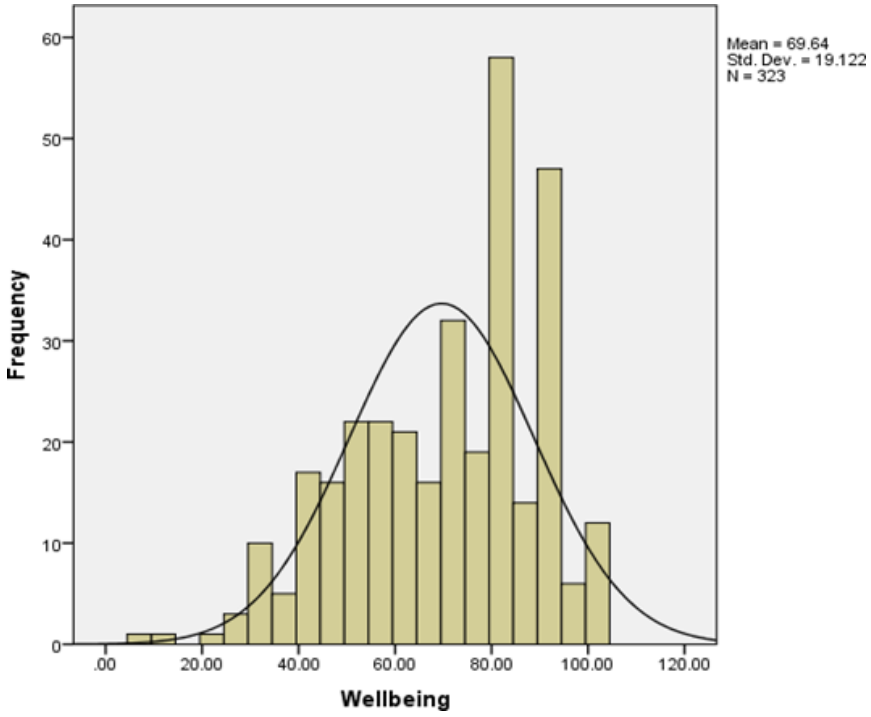
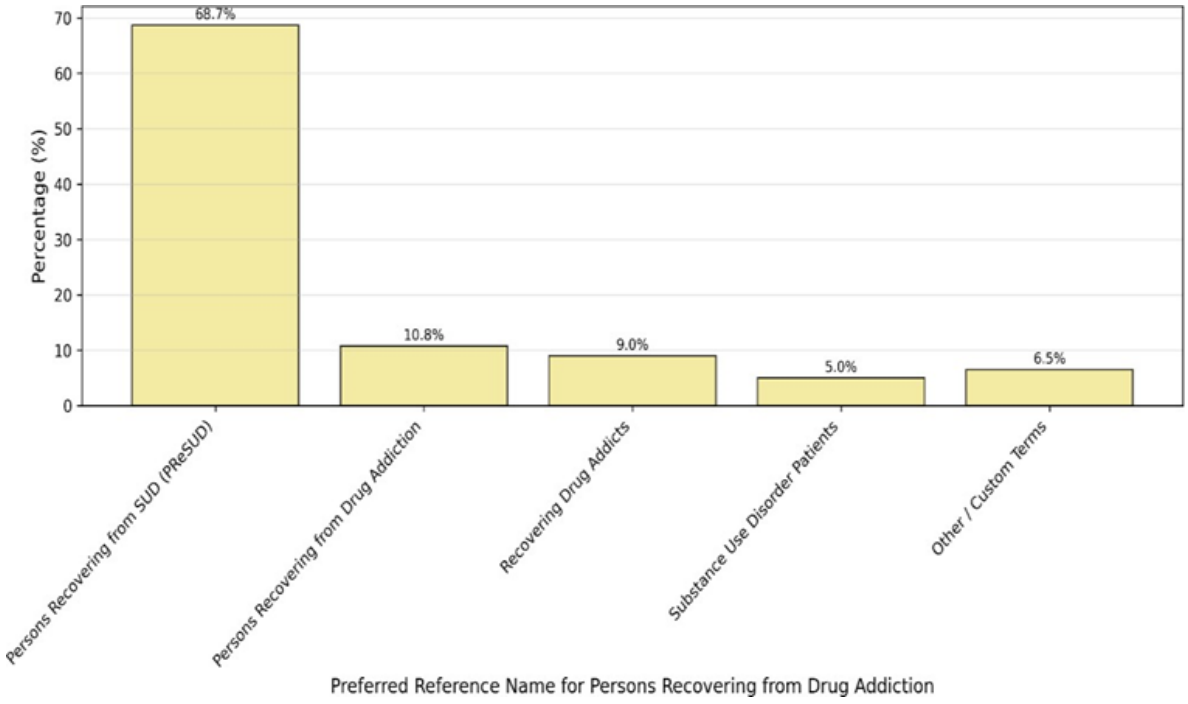


Figure 6 shows a negatively skewed distribution reflecting high wellbeing scores by majority of the respondents. Out of the expected maximum score of 100, only 16.7% scored less than half (below 50), and were considered to have low wellbeing. Furthermore, 3.7% attained the maximum score of 100% and were regarded as having a high level of wellbeing. Almost half (48.3%) of respondents scored 75% of the maximum score attainable, indicating general satisfaction with current lives by most of the respondents. While the relatively high scores may be surprising for the population of study, it should be noted that the respondents were recovering from a very challenging stage in their lives, hence the current life is expected to feel much more satisfying.

The study sought the respondents' opinion on the most suitable term of reference to those recovering from drug addiction. Six choices were provided including 'SUDP' which has been used in this study, and an option to come up with other preferred terms. Figure 7 presents the results.

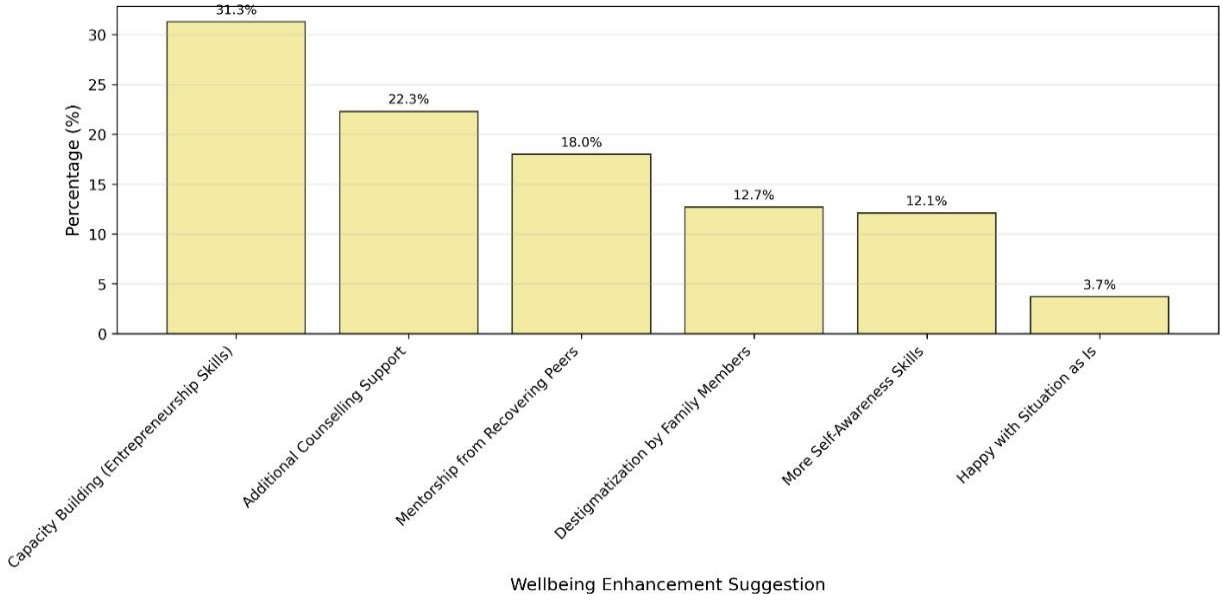
Figure 7. Preferred reference name for persons recovering from drug addiction



As shown in Figure 7, out of the six choices provided and an option to propose a new term, 68.7% of respondents overwhelmingly recommended the use of 'Persons Recovering from Substance Use Disorder' (PReSUD) as the most appropriate. This was followed by the terms 'Persons Recovering from Drug Addiction' at 10.8%, 'Recovering Drug Addicts' at 9%, and 'Substance Use Disorder Patients' at 5% among others. The validation workshop participants supported the use of the term PReSUD owing to its orientation towards recovery.

In response to the question on how the wellbeing of respondents could be enhanced, Figure 8 presents the recommendations.

Figure 8. Respondents' recommendation for wellbeing enhancement



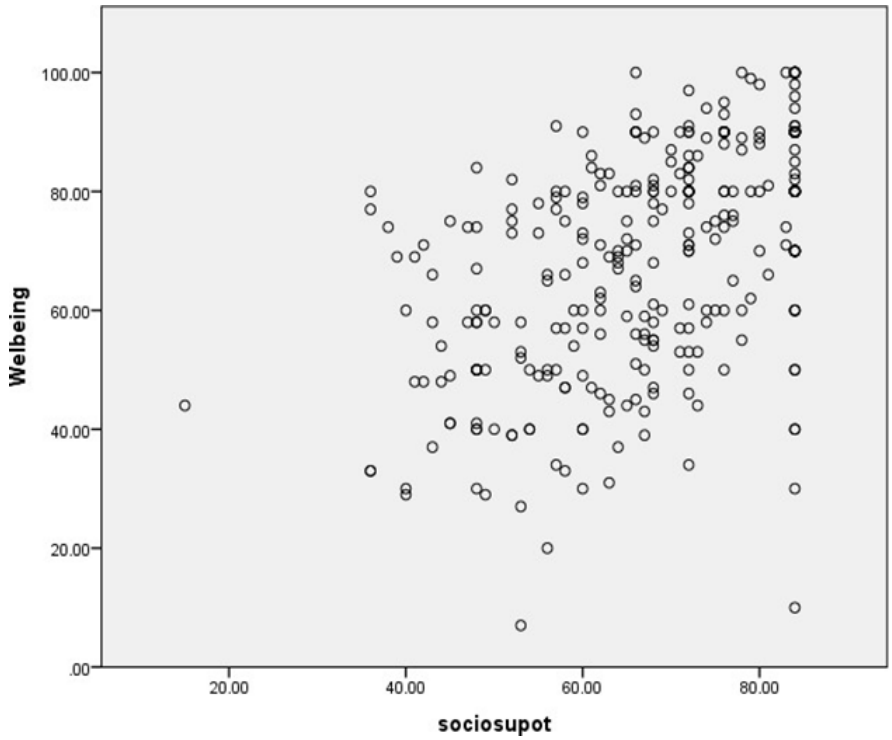
As Figure 8 shows, varied wellbeing recommendation measures were proposed by respondents. About 31.3% of them recommended capacity building with entrepreneurship skills, 22.3% felt that additional counselling support was needed, 18.0% required more mentorship from recovering peers, while 12.7% recommended destigmatized by family members. About 3.7% were happy with the situation as is, but 12.1% need more self-awareness skills to understand themselves, rebuild self-esteem and redefine their goals in life.

Having established high social support and wellbeing scores in this study and considering the positive correlation between social support and wellbeing in previous studies, assessment of the relationship between the two variables among the respondents in this study was conducted.

3.7 The relationship between social support and the wellbeing of respondents

To assess whether the wellbeing of respondents was related to the level of their social support, a correlation test was necessary. A scatterplot was first drawn with 'wellbeing' as the dependent variable as shown in Figure 9.

Figure 9. Scatterplot on the relationship between wellbeing and social support



Although with some outliers, the scatterplot on Figure 9 shows a moderately strong positive relationship between wellbeing and social support. However, to examine whether the relationship was significant a correlation test was conducted, and the results confirmed a moderately strong positive relationship between social support and wellbeing of respondents (r_s=0.56, p=0.01).

3.8 Social support predictors of wellbeing

To assess the social support predictors of wellbeing among the respondents, social support scores in the MSPSS were categorized into three to represent social support from family, social support from friends, and social support from significant/special person. Each category had 4 indicators with a maximum score of seven (7) hence total score attainable per category was 4*7=28.

Binary logistic regression was then conducted after categorizing the dependent variable, 'Wellbeing' into 'Low' and 'High' based on whether respondents scored below or above 50/100. About 16.7% of the respondents were regarded as experiencing 'Low Wellbeing' as they scored below 50/100. The independent variables 'social support

from family', 'social support from friends', and 'social support from significant/special other' together with selected socio-demographic variables were entered as covariates at 95% confidence level. The goodness of fit for the model was tested using the Hosmer and Lemeshow Test which produced a chi-square value of 3.897 and a p-value of 0.866, indicating a good fit for the data. The results of the Binary Logistic Regression are presented in Table 5.

Table 5. Binary logic regression on social predictors of wellbeing

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Family Social Support	.074	.026	7.863	1	.005	1.076	1.022	1.133
Special Person's support	.116	.035	11.046	1	.001	1.123	1.049	1.202
Marital status	1.107	.464	5.695	1	.017	3.026	1.219	7.513
Age	.061	.030	4.143	1	.042	1.062	1.002	1.126
Education Level	.490	.205	5.721	1	.017	1.632	1.092	2.437
Average Income	.339	.220	2.374	1	.123	1.404	.912	2.162
Constant	-8.801	1.616	29.659	1	.000	.000		

From the results in Table 5, age, marital status, education, family social support, and social support from special/significant other were the significant predictors of respondents' wellbeing. However, gender, income and social support from friends were not significantly related to wellbeing. Although correlation tests had shown income and social support from friends as being significantly related to wellbeing, results of the regression analysis imply they are not significant predictors when the model is controlled for the effects of other factors.

With regards to age, older respondents generally had higher wellbeing than younger ones. With p= 0.042 and Exp(B)=1.062, the implication is that each additional year of age increased the odds of enhanced well-being by approximately 6.2%, if all other factors remained constant. In terms of marital status, the married respondents generally had higher wellbeing that all the other categories combined [p=0.017; Exp(B) = 3.026], implying that being married increased the odds of higher well-being by 3.026 times. The level of education was a significant predictor of wellbeing [p= 0.017; Exp(B) =1.632], suggesting that for every one-unit increase in level of education, the odds of higher well-being were enhanced by 63.2%.

Out of the three dimensions of Perceived Social Support, family social support and social support from 'special/significant other' were found to be significant predictors of respondents' wellbeing. For family social support, a p-value of 0.005 and Exp(B) value of 1.076 implies that having a supportive family increased the odds of higher well-being by 7.6%, while having a supportive special person increased the odds of higher wellbeing by 12.3% [p=0.001; Exp(B) = 1.123]. This underscores the critical role of social support from close confidants, whether within the family or outside, for the enhancement of respondents' wellbeing. Friends' support did not significantly predict higher wellbeing although correlation tests had shown a significant relationship, probably because very close friends may have been reported as 'significant other'.

3.9 Discussion of research findings

According to the findings, the youngest age of initiation into drugs was four (4) years. This is two years younger than reported in prior studies (NACADA, 2022) and not only supports the assertion that Central Kenya has an increase in the number of children taking drugs but also shows that initiation into drugs is starting earlier. The findings also show that more than one quarter (28.5%) of the respondents were using drugs by the time they were 13 years of age, a situation that should be of major concern to all stakeholders particularly parents and educationists. This challenges the general assumption that drug use is a teenage issue which may be a contributor to the limited efforts being directed towards addressing substance use among children, including pre-teens and younger ages. With the mean age of initiation into drugs being 15.75

years (SD=4.1), the implication is that most respondents got initiated at between 11-19 years, an age when majority are expected to be in primary and secondary schools. This corresponds with findings from other scholars who found that most individuals get initiated into drugs as minors (Mahsoon et al, 2023; NACADA, 2022). Although the average age of initiation into drugs in Kenya is a serious concern and varies with substances and population being studied, most scholars agree that drug use is rampant among school children (Musyoka et al., 2020; NACADA, 2022; Otiende & Odhiambo, 2017) and requires more attention than it currently receives. A gendered perspective where more males than females abuse drugs at approximately 89% and 11% respectively (Tamara et al, 2023) appears to reflect among those recovering at 80.5% and 19.5% respectively, implying the need for a gendered intervention approach.

In line with previous research, this study found that the factors that mainly pushed and/or pulled individuals into substance use include peer pressure, stress, curiosity, desire to escape from reality and negative role modeling (Attila et al., 2023; Bahr et al., 2021; Jouhki & Oksanen, 2021; Musyoka et al., 2020). Furthermore, the use of alcohol in most respondents' homes during celebrations seemed to signal that achievements should be celebrated with alcohol, hence encouraging the children to do the same whenever opportunities arise. Easy access to alcohol and drugs at home, including sending children to purchase cigarettes for adult relatives provided opportunities for children to try drugs. This concurs with prior studies on how family influences the children's risk of initiation into substance use (Atadokht et al, 2015; Li & Song, 2022; Mahsoon et al, 2023).

From the findings, strong social support reinforced the commitment to stay drug-free as indicated by 20.4% of respondents who cited family reasons, and 16.4% who credited their successful recovery journey to support received from social networks who accepted and supported them. This corresponds with existing research which shows that strong attachment to significant others, involvement in pro-social activities, and belief in validity of social values enhances conformity to social norms (Hirsch, 1969), including abstaining from substance use. Fulfillment of the social support needs at different stages of an individual's life was found to positively influence the

prevention, treatment and recovery efforts. Although the decision to stay drug-free was reported to be largely personal, social support gave respondents the motivation to keep away from drugs despite cravings and peer pressure.

During initiation into drugs, social support from family, friends and community were necessary in preventing young people from getting into drug use. This corresponds with Lardier et al (2017) who reported that youth with greater neighborhood sense of community were less influenced by negative environmental experiences. In addition, Hirschi (1969) in his social control theory argued that strong bonds with family, friends and other social networks motivate individuals to engage in responsible behavior and refrain from deviant pursuits such as substance use as evidenced in this study.

To avoid continued use, the need for family, friends and community members to reduce the stigma associated with drug addiction by listening rather than judging was emphasized. It was in the spirit of decriminalizing and destigmatizing drug addiction that 68.7% of respondents recommended the use of 'Persons Recovering from Substance Use Disorder' to replace 'drug addict' as the most appropriate term to refer to those recovering from drug addiction. This corresponds to observations by Birkeland et al (2021) who reported that negative social perception of SUDPs leads to low levels of family support to affected drug users, making it challenging for them to seek help when in distress (UNODC, 2023; 2009).

During recovery, the need for family, friends and significant others to support those recovering by providing opportunities for engaging in socio-economic and other meaningful activities was recommended by respondents, key informants and FGD participants. This concurs with Bahl et al (2022) who explained that supportive and motivating community relationships are important components during recovery. According to Muller et al (2017), participating in a social network that is supportive of recovery is associated with treatment completion, greater abstinence, and greater wellbeing hence the need for stakeholders' support for recovering individuals.

Considering the significant positive relationship between social support and wellbeing (Aksoy et al, 2024; Liu et al, 2022; Lookatch et al, 2019; Thuku, 2022), the level of social support and wellbeing of respondents was measured. Social support was measured

using the MSPSS which has consistently shown good reliability, validity, and a stable factorial structure across populations (Zimet et al, 1988). The pilot test showed that the tool was reliable (α=0.854) and valid in the local Kenyan context. From the findings, majority of the respondents felt adequately social supported with only 3.7% scoring less than half, and 23.8% attaining the maximum possible score. The need to enhance wellbeing was reported as being behind the factors that motivated respondents to stay drug-free.

Respondents reported that health, psycho-social, economic and spiritual reasons were the main factors behind the decision for drug abstinence. From the findings, life-threatening health conditions, family reasons, financial security, and spiritual connectedness which were largely indicated by most respondents as the factors that motivated them to stop using drugs, also happen to be the dimensions of wellbeing measured in the PWI (International Wellbeing Group, 2013; International Wellbeing Group, 2024; Yiengprugsawan et al, 2010). This implies that the PWI used to measure wellbeing in this study was very appropriate for the population. Furthermore, in addition to the PWI having demonstrated good reliability, validity and sensitivity across other cultures, the pilot findings found it reliable in the local Kenyan context (α=0.861). Using the PWI, the study results show that most respondents experienced high wellbeing, with only 16.7% scoring less than half of the maximum score. About 3.7% attained the maximum score of 100%, indicating a satisfying life. With the high wellbeing and adequate social support attained by respondents, a correlation test conducted to determine the relationship between social support and wellbeing established a significant positive relationship ($r_s=0.56$, $p=0.01$). It was, however, necessary to isolate the social predictors of wellbeing among the respondents.

A binary regression analysis was conducted to establish the social and demographic predictors of wellbeing. According to the analysis, age, marital status, education, family social support and 'social support from special/significant person' were significantly related to the wellbeing of respondents. The married older respondents with higher levels of education, supportive family and support from a 'special person/significant other' had the highest wellbeing. The results imply that family support, marital stability

and availability of a supportive special person are key protective factors, and that education and advancement in age also play a significant role in wellbeing enhancement among SUDPs. From the respondents' perspective, their wellbeing can further be enhanced if capacity building on entrepreneurship skills was done, counselling support increased, more support from recovering peers availed, and destigmatization by family and community members practiced. This corresponds with prior studies which underscore the important role of social support in substance use management (Muller et al, 2017; UNODC, 2023; 2009) and wellbeing enhancement (Aksoy et al, 2024; Liu et al, 2022; Lookatch et al, 2019; Thuku, 2022).

3.10 Conclusion

This study established that drug initiation in Kenya, particularly Central Kenya begins at alarmingly early ages, with the youngest reported initiation age being four years old. This is two years younger than prior national reports, underscoring an urgent need for preventive interventions targeting pre-school and primary school children, who currently receive limited attention. The mean age of initiation at 15.75 years (SD=4.1) confirms that substance use generally begins during the school-going years (11-19 years), supporting the assertion that drug use is rampant among school children. This early onset demands a paradigm shift from the current focus, which often treats drug use as primarily a teenage concern.

Aligning with existing literature, the findings identify peer pressure, stress, curiosity, and the desire to escape reality as the primary motivators for initiation into drugs. Notably, the study highlights the significant negative influence of the family environment through negative role modeling, such as the celebratory use of alcohol and easy access to substances at home as major pull factors that normalize and facilitate drug use. The implication is that without responsible parenting, drug use prevention among young children may remain a mirage.

A key finding is the protective role of social support against substance use and its vital role in both recovery and well-being. Individuals with strong bonds with family and significant others are more likely to refrain from drug use and are more successful in their recovery journey. The research strongly supports the critical role of social support

in drug use abstinence, recovery and wellbeing enhancement. A significant percentage of respondents credited their drug-free commitment to supportive families, support from special persons and supportive networks like Alcoholics Anonymous (AA). In this case, the commitment to abstain, while largely personal, was reinforced by robust social support. Furthermore, the need to decriminalize drug addiction was underscored, with a strong recommendation for the use of the term 'Persons Recovering from Substance Use Disorder' (PReSUD) that is recovery oriented and less stigmatizing than ‘drug addict’. This is likely to foster a more accepting and supportive social environment that is needed for individuals to seek and receive help. The findings therefore correspond with Hirschi (1969) social control theory which explains that strong bonds with family, friends and other social networks motivate individuals to refrain from deviant pursuits such as substance use.

Another core finding is the significant positive correlation between social support and the wellbeing of respondents ($r_s=0.56$, $p=0.01$). This confirms that adequate social support is integral to the enhanced wellbeing of individuals recovering from substance use disorder (SUD). The regression analysis further revealed that age, marital status, education, family social support, and support from special persons were the main predictors of enhanced wellbeing. Specifically, married, older, respondents with higher levels of education, strong family support and supportive special persons have the highest chances of enhanced wellbeing. The study established that fulfilment of wellbeing needs (health, psycho-social, economic, and spiritual) is a major motivator for individuals to stay away from drugs.

The study therefore demonstrates a pressing need for early, comprehensive, and family-inclusive preventive strategies to counter the increasingly young age of drug initiation in society. Furthermore, it validates that social support is an essential protective factor and a critical determinant of enhanced wellbeing for individuals recovering from SUD, urging stakeholders to prioritize de-stigmatization and the strengthening of supportive social networks.

3.11 Recommendations

Based on the research findings and conclusion, the study recommends urgent implementation of a substance use prevention and management framework that adopts a multi-sectoral, multi-faceted approach targeting early prevention and sustained recovery support. Having established that initiation into drugs is occurring as early as age four years, a radical shift in prevention and recovery focus should include the following:

- Development and implementation of a mandatory, age-appropriate drug prevention education curriculum starting from pre-school and continuing throughout primary school. This curriculum should focus on building resilience, empowerment to say no to drugs, and healthy coping mechanisms for stress and curiosity.
- Launching of substance use prevention campaigns specifically aimed at parents and caregivers of children aged 3-10years, highlighting the current risk profile and the importance of early intervention.
- Positive Parenting Programmes focusing on positive role modeling, healthy celebration alternatives which replace alcohol use at home, and secure storage/disposal of substances within the home.
- Establishment of structured Community-Based Social Support Networks that connect families dealing with substance use for social support and increase pro-social activities for youth to counteract negative peer pressure.
- Destigmatization Campaigns at local and national level that advocate for the use of the term 'Persons Recovering from Substance Use Disorder' (PReSUD) instead of ‘drug addict’, and discourage judgment towards individuals seeking SUD help.
- Support for establishment and implementation of Integrated Wellbeing Services in all SUD treatment and rehabilitation facilities to ensure comprehensive support that addresses all PWI dimensions (health, psycho-social, economic, and spiritual), as key motivators for recovery.
- Provide opportunities for Capacity Building through relevant stakeholders who can organize and fund counselling and entrepreneurship training programmes for PReSUDs to empower them and provide meaningful engagement opportunities.
- Increase the availability of peer support specialists and facilitate opportunities for consistent social support from caring and trusted persons.

In line with the study recommendations, the substance use prevention and management initiative can be coordinated at Karatina University through the already

established Substance Use Crisis Response Centre (SUCReC). Through SUCReC, the university to:

- actively engage in the implementation of the study recommendations to transform from a research site into a vital engine for regional social change and effective policy implementation for enhanced wellbeing.
- enhance provision of immediate support and engage other stakeholders to provide referral services to those in need of further assistance with substance use related challenges.
- Engage Karatina University students as Peer Mentors and change agents in drug prevention, especially in nearby secondary and primary schools, to build pro-social protective factors among younger youth and children.
- be the regional research hub for substance use prevention and management, including translating research findings into actionable, evidence-based programme models for use by schools and other social institutions thus making Karatina University a resource hub for the community on substance use issues.
- develop specialized short courses and modules to build capacity of key stakeholders including teachers, parents, school guidance counselors, and Community Leaders to address the vice.
- to partner with other institutions and stakeholders to evaluate the impact of intervention programmes on wellbeing and productivity.
- use her platforms (seminars, public forums, student activities, social media) to actively lead the 'Destigmatization Campaign' by promoting the use of the term 'Persons Recovering from Substance Use Disorder (PReSUD)' and conduct sensitization on the role of social support on the recovery of PReSUDS.

Areas of Further Research

For a better understanding of the relationship between social support and wellbeing, further research is recommended as follows:

- A longitudinal study on the impact of social support on the wellbeing of different special populations
- A study on the role of social support on the wellbeing of persons with SUD that includes those who are yet to start treatment as well as those on recovery
- A national study on the relationship between social support and the wellbeing and productivity of community members.

References

Aksoy, O., Wu, A. F. W., Aksoy, S., & et al. (2024). Social support and mental well-being among people with and without chronic illness during the Covid-19 pandemic: Evidence from the longitudinal UCL covid survey. *BMC Psychology, 12*, 136. https://doi.org/10.1186/s40359-024-01596-x

Atadokht, A., Hajloo, N., Karimi, M., & Narimani, M. (2015). The role of family expressed emotion and perceived social support in predicting addiction relapse. *International Journal of High Risk Behaviors and Addiction, 4*(1). https://doi.org/10.5812/ijhrba.21250

Attila, F. L., Agyei-Sarpong, K., Asamoah-Gyawu, J., Dadebo, A. A., Eshun, E., Owusu, F., & Barimah, S. J. (2023). Youthful curiosity as a predictor of substance use among students. *Mediterranean Journal of Social & Behavioral Research, 7*(2), 59-64. https://doi.org/10.30935/mjosbr/12807

Bahl, N. K. H., Oversveen, E., Brodahl, M., Nafstad, H. E., Blakar, R. M., Ness, O., Landheim, A. S., & Tommervik, K. (2022). In what ways do emerging adults with substance use problems experience their communities as influencing their personal recovery processes? *Journal of Community Psychology, 50*(8), 3070–3100.

Bahr, S. J., Hoffmann, J. P., & Motes, R. (2021). Adolescent substance use and the effects of parental and peer influence. *Journal of Adolescent Research, 36*(4), 543–573. https://doi.org/10.1177/0743558420915902

Birkeland, B., Weimand, B., Ruud, T., & et al. (2021). Perceived family cohesion, social support, and quality of life in patients undergoing treatment for substance use disorders compared with patients with mental and physical disorders. *Addiction Science & Clinical Practice, 16*, 44. https://doi.org/10.1186/s13722-021-00252-8

Ferreira, F., & Ferreira, P. (2020). The relationship between stress and substance use. *ResearchGate*. https://www.researchgate.net/publication/12510972_A_Bibliographic_Essay_The_Relati onship_between_Stress_and_Substance_Use

Hirschi, T. (1969). *Causes of delinquency*. University of California Press.

International Wellbeing Group. (2013). *Personal Wellbeing Index: 5th Edition*. Australian Centre on Quality of Life, Deakin University. http://www.acqol.com.au/instruments#measures

International Wellbeing Group (2024). *Personal Wellbeing Index Manual: 6th Edition*, Version 2, 190624, pp. 1-55. Cummins, R. A. (Ed.). Geelong: Australian Centre on Quality of Life, School of Psychology, Deakin University – Melbourne Campus. http://www.acqol.com.au/publications#Open-access

Isham, A., Mair, S., & Jackson, T. (2020). *Wellbeing and productivity: A review of the literature* (CUSP Working Paper No 22). University of Surrey. https://www.cusp.ac.uk/powering-productivity

Jetten, J., Haslam, C., & Haslam, S. A. (Eds.). (2012*). The social cure: Identity, health and well-being*. Psychology Press.

Jouhki, H., & Oksanen, A. (2021). To get high or to get out? Examining the link between addictive behaviors and escapism. *Substance Use & Misuse, 57*(2), 202–211. https://doi.org/10.1080/10826084.2021.2002897

Khumalo, I. P., Ejoke, U. P., Oppong Asante, K., & Rugira, J. (2021). Measuring social well-being in Africa: An exploratory structural equation modelling study. *African Journal of Psychological Assessment, 3*(0), a37. https://doi.org/10.4102/ajopa.v3i0.37

Kinyanjui, M. (2023, September 11). Alcohol is the most abused drug in Kenya–NACADA. *Citizen Digital*. https://www.citizen.digital/news/alcohol-is-the-most-abused-drug-in-kenya-nacada-n327114

Kuyeya, F. (2021). Effectiveness of treatment and rehabilitation programs for drug and substance dependence in Mombasa County, Kenya. *African Journal of Alcohol & Drug Abuse, 6,* 3-14.

Lardier, D. T., Jr., Marisa, M., Veronica, R., Barrios, P. G. R., & Robert, J. (2017). The moderating effect of neighborhood sense of community on predictors of substance use among Hispanic urban youth. *Journal of Ethnicity in Substance Abuse, 17*(4), 434-459.

Li, C., & Song, G. (2022). A qualitative study of drug treatment conformity behavior among young drug users who are in recovery in China. *International Journal of Environmental Research and Public Health, 19*(22), 14832. https://doi.org/10.3390/ijerph192214832

Liu, L., Meng, W., & Liu, B. (2022). The mediating role of social support in the relationship between parenting styles and adolescent drug abuse identification. *Frontiers in Psychology, 12*, 802408. https://doi.org/10.3389/fpsyg.2021.802408

Lookatch, S. J., Wimberly, A. S., & McKay, J. R. (2019). Effects of social support and 12-step involvement on recovery among people in continuing care for cocaine dependence. *Substance Use & Misuse, 54*(13), 2144-2155.

https://doi.org/10.1080/10826084.2019.1638406

Mahsoon, A., Almashat, L., Alsubaui, N., et al. (2023). Socio-demographics of initial substance use exposure and its relation to progression: A cross-sectional study in Saudi Arabia. *Cureus, 15*(8), e42795. https://doi.org/10.7759/cureus.42795

Moos, R. H. (2007). Theory-based active ingredients of effective treatments for substance use disorders. *Drug and Alcohol Dependence, 88*(2-3), 109–121. https://doi.org/10.1016/j.drugalcdep.2006.10.010

Muller, A. E., Skurtveit, S., & Clausen, T. (2017). Building abstinent networks is an important resource in improving quality of life. *Drug and Alcohol Dependence, 180,* 431–438. https://doi.org/10.1016/j.drugalcdep.2017.09.006

Musyoka, C. M., Mbwayo, A., Donovan, D., & Mathai, M. (2020). Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns. *PLOS ONE, 15(*8), e0238170. https://doi.org/10.1371/journal.pone.0238170

NACADA. (2011). *Alcohol use in Central Province of Kenya: A baseline survey on magnitude, causes and effects from the perspective of community members and individual users* (Policy Brief No. 4/2011). National Authority for the Campaign Against Alcohol and Drug Abuse. https://nacada.go.ke

NACADA. (2021). *Assessment of emerging trends of drugs and substance abuse in Kenya.* National Authority for the Campaign Against Alcohol and Drug Abuse. https://nacada.go.ke

NACADA. (2022). *National survey on the status of drugs and substance use in Kenya*. National Authority for the Campaign Against Alcohol and Drug Abuse. https://nacada.go.ke

Ramara, T., Munayi, S., Bailasha, N., & Chumba, J. (2023). The prevalence of drug abuse as it relates to psychosocial reasons among university athletes in selected competitive sports in Kenya. I*nternational Journal of Psychology, 8*(4), 1–18. www.ajpojournals.org

Sussman, S., Kattari, S. K., Baezconde-Garbanati, L., & Glackin, S. N. (2020). Commentary: The problems of grouping all adversity into a special populations label. *Evaluation & the Health Professions, 43*(1), 66–70. https://doi.org/10.1177/0163278719882738

Thuku, P. (2022). The relationship between community adherence to COVID-19 containment measures and the wellbeing of older adults in rural Kenya. *Gerontology and Geriatric Medicine, 8*, 1-12. https://doi.org/10.1177/23337214221105981

Tunçgenç, B., van Mulukom, V., & Newson, M. (2023). Social bonds are related to health behaviors and positive well-being globally. *Science Advances, 9*(2), eadd3715. https://doi.org/10.1126/sciadv.add3715

United Nations Office on Drugs and Crime. (2009). *Manual on victimization surveys*. United Nations Publications. https://www.unodc.org/documents/data-and-analysis/Crime-statistics/Manual_on_Victimization_surveys_2009_web.pdf

United Nations Office on Drugs and Crime. (2023). *World Drug Report 2023*. United Nations Publications. https://www.unodc.org/res/WDR-2023/WDR23_Exsum_fin_SP.pdf

Ventura, C. A. A., Carrara, B. S., Fernandes, R. H. H., & et al. (2022). General beliefs about illicit drug use and stigma: Perspective of people who use illicit drugs. *Community Mental Health Journal, 58,* 1346-1353. https://doi.org/10.1007/s10597-022-00944-8

Yaakop, N., Koh, D., & Yasin, R. M. (2023). A content validation of focus group discussions based on need analysis in a physical education training module for

primary school teachers. *Federación Española de Asociaciones de Docentes de Educación Física (FEADEF), 50,* 1115-1122.

Yiengprugsawan, V., Seubsman, S., Khamman, S., Lim, L. L., Sleigh, A. C., & the Thai Cohort Study Team. (2010). Personal wellbeing index in a national cohort of 87,134 Thai adults. *Social Indicators Research, 98*(2), 201–215. https://doi.org/10.1007/s11205-009-9542

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52*, 30-41.

Sub-appendix B1

Interview schedule for recovering substance use disorder patients

SECTION A: Socio-Demographic Characteristics (Kindly answer this section by ticking on the appropriate answer, or filling in the spaces provided)

1. County of residence/Kaunti ya makazi: _____
2. Age in years/ Umri: _____
3. Occupation/ Kazi: _____
4. Gender/ Jinsia:
   i. Male/Mwanamume ( )
   ii. Female/ Mwanamke ( )
5. Marital Status/Hali ya Ndoa:
   i. Married/Aliyeoa/Aliyeolewa ( )
   ii. Single (never married)/ Hajaolewa/oa(Hajawahi kuolewa/oa)( )
   iii. Separated/Kutengana ( )
   iv. Divorced/Talaka( )
   v. Widowed/Mjane ( )
6. Highest level of formal education/Kiwango cha elimu:
   i. None/Hajasoma ( )
   ii. Primary school/Shule ya msingi ( )
   iii. Secondary school/Shule ya Sekondari ( )
   iv. Middle Level College/TVET/Chuo cha elimu ya kati ( )
   v. Undergraduate degree/ Shahada ya kwanza ( )
   vi. Postgraduate degree/Shahada ya uzamili ( )
7. Which is your main source of income/Chanzo kikuu cha mapato( )
   i. Salary from formal employment/Mshahara kutoka kwa ajira rasmi ( )
   ii. Income from self-employment/ Mapato ya kujiajiri ( )
   iii. Donations/Misaada ( )
   iv. Other sources/Njia zingine za mapato ( ), please specify/tafadhali fafanua_____
8. Average income in Kenya shillings (from all sources) per month/Kiwango cha mapato ya wastani kwa mwezi:
   i. Below 10,000/ Chini ya 10,000( )
   ii. 10,000-20,000 ( )
   iii. 20,001-40,000 ( )
   iv. 40,001-80,000 ( )
   v. Above 80,000/Zaidi ya 80,000( )

SECTION B: Short Answer Questions/Maswali ya majibu mafupi (Kindly answer this section by ticking on the appropriate answer, or filling in the spaces provided)

9. At what age were you when you took your very first drug of abuse?/ Ulikuwa na umri gani ulipotumia dawa ya kulevya kwa mara ya kwanza? _____

10. Which was your first drug of abuse to take?/Dawa ya kwanza ya kulevya uliyoitumia?
    i. Alcohol/Pombe ( )
    ii. Tobacco/ Tumbaku ( )
    iii. Marijuana/Bangi ( )
    iv. Miraa ( )
    v. Prescription drugs/dawa za maagizo( )
    vi. Others/zingine ( ), please Specify/Tafadhali fafanua _____

11. What made you take that first drug? Nini kilisababisha utumie dawa ya kulevya mara ya kwanza?
    i. Peer pressure/ Shinikizo/msukumo wa rika ( )
    ii. Stress/Msongo wa mawazo ( )
    iii. Curiosity/Kutaka kujua ( )
    iv. Other reasons/ sababu zingine ( ), please Specify/ Tafadhali fafanua_____

12. Who introduced you to your very first drug of abuse as mentioned in Question 10/ Nani alikufanya utumie dawa ya kulevya ya kwanza uliyoitaja kwa Nambari 10?
    i. Parent/mzazi ( )
    ii. Sibling/Ndugu ( )
    iii. Other relative/Ndugu wa ukoo ( ), kindly specify/ Tafadhali fafanua _____
    iv. Friend/Rafiki ( )
    v. Others/wengine ( ), please specify/ Tafadhali fafanua _____

13. How long (in years and/or months) have you stayed drug free/ Umekaa bila kutumia dawa za kulevya kwa muda gani sasa?(miaka na/au miezi)_____

14. What informed your decision/commitment to stay away from drugs? Ni nini kilichokusukuma mpaka ukaamua kutotumia dawa za kulevya tena?
    i. Life threatening health reasons/ Sababu za kiafya zinazohatarisha maisha ( )
    ii. Family reasons/ mambo ya kifamilia ( )
    iii. Economic reasons/ Sababau za kiuchumi ( )
    iv. Social support groups/ vikundi vya usaidizi wa kijamii ( )
    v. Spiritual reasons/ Sababu za kiroho( )
    vi. Others/ zingine ( ), please Specify/ Tafadhali fafanua _____

15. How did drug abuse affect the following aspects of your wellbeing/ Utumizi wako wa dawa za kulevya kuliadhiri vipi maswala yafuatayo?

SECTION C: Likert Scale Questions examining Perceived Social Support and Wellbeing.

17. Kindly answer the following questions by inserting a tick (✓) under the number that best describes your extent of agreement or disagreement with each statement out of a score of seven (7) where one (1) means you 'Very Strongly Disagree', and seven (7) means you 'Very Strongly Agree'.

S. No.	**Statement**	7	6	5	4	3	2	1
i.	There is a special person who is around when I am in need/ *Yupo mtu wa kipekee ambaye yuko tayari kunisaidia ninapohitaji.*							
ii.	There is a special person with whom I can share joys and sorrows/ *Yupo mtu wa kipekee amabaye naweza kumshirikisha furaha na huzuni zangu.*							
iii.	My family really tries to help me/ *Familia yangu hujaribu kunisaidia sana.*							
iv.	I get the emotional help & support I need from my family/ *Napata Faraja na usaidizi wa kihisia ninaohitaji kutoka kwa familia yangu.*							
v.	I have a special person who is a real source of comfort to me/ *Ninaye mtu wa kipekee anayenifariji sana.*							
vi.	My friends really try to help me/ *Marafiki zangu wanajitahidi sana kunisaidia.*							
vii.	I can count on my friends when things go wrong/ *Naweza wategemea marafiki zangu mambo yakienda mrama.*							
viii.	I can talk about my problems with my family/ *Naweza zungumza na familia yangu kuhusu matatizo yangu .*							
ix.	I have friends with whom I can share my joys and sorrows/ *Ninao marafiki ambao naweza shirikisha kwa furaha na huzun*							
x.	There is a special person in my life who cares about my feelings/ *Ninaye mtu wa kipekee anayejali hisia zangu.*							
xi.	My family is willing to help me make decisions/ *Familia yangu iko tayari kunisaidia kufanya uamuzi.*							
xii.	I can talk about my problems with my friends/ *Naweza kuzungumza na marafiki wangu kuhusu shida zangu.*							

18. Kindly answer the following questions by inserting a tick (✓) under the number that best describes your level of satisfaction with each statement out of a score of ten (10) where zero (0) means you have 'No satisfaction at all, and 10 means you are 'Completely Satisfied.

	Statement	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	How satisfied are you with your life as a whole/ *Umeridhika kiasi gani na maisha yako kwa ujumla?*											
2	How satisfied are you with your standard of living/ *Umeridhika kiasi gani na kiwango cha maisha yako*?											
3	How satisfied are you with your health/ *Umeridhika kiasi gani na afya yako?*											
4	How satisfied are you with achievements in your life/ *Umeridhika kiasi gani na yale umefanikisha kimaisha?*											

i. Psychological Satisfaction with own life/ Vile unavyojihisi kimaisha

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

ii. Social relationships with family/ Uhusiano na familia

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

iii. Social relationships with friends/ Uhusiano na marafiki

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

iv. Social relationships with acquaintances/ Uhusiano na watu tunaofahamiana

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

v. Financial security/ Hali ya Uchumi wako

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

vi. Spiritual connectedness/ Hali ya kiroho

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

vii. Health/ Afya yako

i. Negatively (nilidhoofika) ii. No effect (bila adhari) iii. Positively (niliimarika)

16. During recovery, name three main sources of social support (in order of importance), and how they support/ Kwa wakati huu wa urejesho kutokana na uraibu, taja mifumo mitatu ya kijamii na jinsi iliyvokusaidia:

i. _____

_____

ii._____

_____

iii._____

_____

5	How satisfied are you with your personal relationships/ *Umeridhika kiasi gani na uhusiano kati yako na wengine?*											
6	How satisfied are you with your relationship with your family/ *Umeridhika kiasi gani na uhusiano kati yako na familia?*											
7	How satisfied are you with your relationship with your friends/ *Umeridhika kiasi gani na uhusiano kati yako na marafiki?*											
8	How satisfied are you with your personal safety/ *Umeridhika kiasi gani na usalama wako?*											
9	How satisfied are you with feeling part of your community/ *Umeridhika kiasi gani kwa kujihisi kuwa mmoja wa jamii?*											
10	How satisfied are you with your future security/ *Umeridhika kiasi gani na usalama wako wa siku zijazo?*											
11	How satisfied are you with your spirituality/ *Umeridhika kiasi gani na hali yako ya kiroho?*											

19. Kindly make any other comment related to social support needs of recovering Substance Use Disorder Persons/ Tafadhali toa maoni yoyote mengine yanayohusiana na mahitaji ya msaada wa kijamii kwa watu wanaoendelea kupona kutokana na matumizi ya dawa za kulevya
    1. No comment (sina maoni)
    2. Social support is adequate (msaada wanaopata watosha
    3. More social support is needed (msaada zaidi wahitajika)
    4. Support with income generating opportunities
20. In your opinion, which of the following terms should be used when referring to persons recovering from drug use?
    i. Recovering Drug Addicts
    ii. Drug Addiction Recovering Persons
    iii. Persons Recovering from Drug Addiction
    iv. Substance Use Disorder Patients
    v. Drug Addiction Recovering Patients
    vi. Persons Recovering from Substance Use Disorder
    vii. Any other (kindly suggest) _____

21. Kindly make any other comment related to how the wellbeing of recovering Substance Use Disorder Persons can be enhanced/ Tafadhali toa maoni yoyote mengine yanayohusiana na vile ustawi wa watu wanaoendelea kupona kutokana na matumizi ya dawa za kulevya unaweza kuboreshwa:
    i. No comment (sina maoni)
    ii. Need for entrepreneurship skills
    iii. Need for counselling
    iv. Support from recovering peers
    v. Destigmatization by family members
    vi. Self-awareness

Sub-appendix B2

Interview guide for social support group leaders and rehabilitation centre managers

i. What mainly pushes individuals into substance use in this region? / *Ni nini kinachowasukuma watu katika eneo hili kutumia dawa za kulevya?*

ii. What factors pull individuals towards substance use? / *Ni nini kinachowavutia watu katika eneo hili kutumia dawa za kulevya?*

iii. From experience, how does substance abuse affect the health, financial, social, psychological and spiritual wellbeing of your clients? / *Kutokana na uzoefu wako, utumizi mbaya wa dawa za kulevya unaadhiri vipi afya, Uchumi, uhusiano wa kijamii, ustawi wa kisaikolojia na hali ya kiroho ya wateja wako?*

iv. Based on your experience, which are the main motivators to stop using drugs? / *Kutokana na uzoefu wako vishawishi vikuu vinavyowafanya watu kuwacha kutumia dawa za kulevya ni gani?*

v. Which are the major social support needs of Substance Use Disorder Persons? / *Ni mahitaji gani makubwa ya msaada wa kijamii yanayohitajika na watu wanao uraibu wa dawa za kulevya?*

vi. What sources/forms of social support are available for Substance Use Disorder Persons? / *Ni vyanzo/mifumo gani ya misaada ya kijamii inayopatikana kwa wanaoadhirika na uraibu wa vileo?*

vii. What role does social support from each of the sources mentioned (above) play in the wellbeing of Substance Use Disorder Patients? / *Vyanzo/mifumo iliyotajwa kama jawabu la hapo awali (vi) huchangia ustawi wa waraibu wa dawa za kulevya na njia ipi?*

Sub-appendix B3

Focus group discussion (FDG) guide

i. What mainly pushes individuals into Substance use? / *Ni nini kinachowasukuma watu kwa utumizi wa dawa za kulevya?*

ii. What pulls individuals towards Substance use? / *Ni nini kinachowavutia watu kwa utumizi wa dawa za kulevya?*

iii. How does family, friends, community and other acquaintances contribute to: / *Ni vipi ambavyo familia, marafiki, jamii na watu wengine huchangia kwa:*
- ✓ Initiation of individuals to substance use/ *Uanzilishi wa matumizi ya dawa za kulevya?*
- ✓ Continued use of drugs after initiation/ *Kuendelea kutumia dawa za kulevya baada ya uanzilishi?*
- ✓ The decision to stop using drugs/ *Uamuzi wa kuachana na utumizi wa dawa za kulevya?*
- ✓ The recovery process/ *wakati wa kuendelea kupona?*

iv. What kind of support from family, community and significant others is needed by individuals to reduce their: / *Ni usaidizi upi kutoka kwa familia, jamii na wahusika wa karibu unaohitajika katika kupunguza:*

- ✓ risk of initiation into drug use/ *Hatari ya kuanza matumizi ya dawa za kulevywa*
- ✓ Continued use of drugs after initiation/ *Kuendelea kutumia dawa za kulevya baada ya kuanza*
- ✓ Chances of relapse during recovery/ uwezekano wa kurudi kutumia dawa za kulevya unapoendelea kupona

v. How does drug use affect wellbeing (health, financial, social, psychological, spiritual) at individual, family and community level? / *Ni vipi ambavyo utumizi wa dawa za kulevya unaadhiri afya, uchumi, uhusiano, fikira na hali ya kiroho ya mtu binafsi, familia na jamii?*

vi. What are the major sources of social support for Substance Use Disorder Persons in this area? / *Ni mahitaji gani makubwa ya usaidizi wa kijamii yanayohitajika na watu wanao uraibu wa dawa za kulevya katika eneo hili?*

vii. How does social support from significant others influence the wellbeing and recovery of Substance Use Disorder Persons? Ni vipi usaidizi wa kijamii kutoka kwa wahusika wa karibu unachangia katika ustawi na uponyaji wa waraibu wa dawa za kulevya?

Tanzania

Positive Affect, Life Satisfaction, and the Role of Social Capital: A Study of Tanzanian Communities

1 Introduction

In recent years, the discourse on development has expanded beyond purely economic indicators to include subjective dimensions of well-being such as happiness, emotional health, and life satisfaction. Development scholars and practitioners increasingly recognize that how individuals feel about their lives (their levels of optimism, satisfaction, and emotional balance) is not only an outcome of development but also a determinant of sustainable social and economic progress (Diener et al., 2015; Alkire, 2016). This shift emphasizes the need to understand the psychological and social foundations of well-being, particularly in low- and middle-income countries where structural constraints coexist with strong communal systems.

Among the constructs that influence subjective well-being, positive affect (PA)—the experience of pleasurable emotions such as enthusiasm, inspiration, and alertness—and life satisfaction (LS)—a cognitive evaluation of one's overall life circumstances—are considered key indicators (Watson, Clark, & Tellegen, 1988; Diener et al., 1985). These emotional and evaluative dimensions of well-being are shaped by both internal psychological factors and external social environments. One particularly influential external factor is social capital: the networks, norms, and trust that enable collective action and social cohesion (Putnam, 2000; Woolcock & Narayan, 2000).

In African contexts, and particularly in Tanzania, social capital plays a critical role in shaping individual and community resilience. Extended family systems, communal labor arrangements (such as ujamaa), religious associations, and neighborhood networks have long served as informal safety nets and sources of emotional and material support (Narayan & Pritchett, 1999; Moser, 1998). However, few empirical studies have examined how these dimensions of social capital—trust, interpersonal relationships, and community engagement—contribute to individuals' emotional well-being and life satisfaction in contemporary Tanzanian settings.

Moreover, while research on subjective well-being in high-income countries often highlights personal autonomy and material success, studies in Sub-Saharan Africa suggest that community belonging and supportive social ties may play a more significant role in emotional flourishing (Helliwell et al., 2023). This raises important questions about whether and how social capital moderates or mediates the relationship between emotional states (like positive affect) and overall life satisfaction in these contexts.

This study seeks to fill this empirical gap by investigating the relationship between positive affect and life satisfaction, and examining how different forms of social capital influence or moderate this relationship across diverse communities in Tanzania. By drawing on nationally relevant data and validated psychological and sociological measures, this research aims to contribute to the broader understanding of well-being from a development lens and offer context-specific insights that can inform community and policy interventions.

2 Literature Review

Over the past two decades, there has been growing recognition in development studies that subjective well-being (SWB) is an essential complement to traditional indicators of economic progress. Subjective well-being encompasses both positive affect—the experience of emotions such as enthusiasm, energy, and optimism—and life satisfaction, a cognitive judgment of one's life conditions (Diener et al., 1985; Diener et al., 2018). While most research in this area has focused on high-income contexts, an emerging body of literature explores the unique social, cultural, and economic determinants of well-being in Sub-Saharan Africa (Helliwell et al., 2023; Tiliouine et al., 2016).

Among the most consistent findings in global well-being literature is the importance of social relationships. Positive affect and life satisfaction are strongly influenced by the quality of interpersonal connections, sense of belonging, and community participation (Lyubomirsky et al., 2005). This has led researchers to consider social capital—the web of trust, networks, norms, and civic engagement—as a key predictor of subjective well-

being (Putnam, 2000; Helliwell & Putnam, 2004). Social capital operates at both the individual level (e.g., close personal networks) and the collective level (e.g., generalized trust, shared norms), shaping emotional resilience and perceptions of life quality.

In low-income countries, social capital may serve as a substitute for weak formal institutions, providing informal safety nets and psycho-social support (Woolcock & Narayan, 2000; Narayan & Pritchett, 1999). In Tanzania, studies have shown that community-based associations, religious groups, and extended kinship networks provide both material assistance and emotional reassurance during times of hardship (Moser, 1998). This makes social capital a potentially critical factor in shaping subjective well-being, especially in rural areas where access to public services is limited.

However, the literature also identifies that not all social capital is uniformly beneficial. Excessive social obligations or community pressure may generate emotional strain or reduce individual autonomy, particularly among women and lower-income groups (Makiwane et al. 2017). These potential "costs of belonging" are rarely addressed in development literature, despite being salient in African contexts where social reciprocity is culturally embedded and economically significant.

Although some cross-country studies (e.g., Helliwell et al., 2023) show strong correlations between social trust and life satisfaction, there is limited empirical work within Tanzania that disaggregates the dimensions of social capital—such as interpersonal trust, social networks, and community participation—and examines how they relate to both emotional states (positive affect) and cognitive well-being (life satisfaction). Additionally, few studies examine whether social capital acts as a moderator, influencing the strength or direction of the relationship between affect and life satisfaction.

This study addresses these gaps by applying validated tools (PANAS and SWLS) to explore how different forms of social capital shape emotional and life satisfaction outcomes in Tanzanian communities. In doing so, it contributes to a more holistic understanding of well-being in African development contexts, moving beyond income-based metrics to include social and emotional dimensions of human flourishing.

3 Materials and Methods

3.1 Study area

This study aimed to capture national-level insights into well-being and social capital by covering a cross-section of communities across Tanzania Mainland. To achieve this, the country was divided into its five major geographical zones: Northern, Central, Lake, Southern Highlands, and Coastal. From each of these zones, one region was randomly selected to represent its unique socio-cultural and economic characteristics. The selected regions were Tanga from the Northern zone, Tabora from the Central zone, Mara from the Lake zone, Njombe from the Southern Highlands, and Lindi from the Coastal zone.

In each of these regions, one urban district and one rural district were randomly selected to allow for meaningful comparisons between urban and rural contexts. This design was intended to ensure that the study reflected the spatial and demographic diversity of the country, including differences in access to services, community structure, and livelihood patterns. The approach also allowed for a balanced understanding of how positive affect, life satisfaction, and social capital manifest across different types of communities.

3.2 Sampling strategy and sample size

The sampling strategy was guided by the goal of achieving statistical representativeness while capturing regional and zonal diversity. The sample size was calculated using the Cochran formula, which provided a minimum required sample size of 384 respondents to ensure a 95% confidence level and a 5% margin of error. To strengthen the robustness of the analysis and account for regional variation, a slightly higher sample was targeted. A total of 397 adults aged 18 to 64 participated in the survey.

Sample distribution across the ten selected districts was based on the population size of each region and the relative size of the zone it represented. This approach allowed for fair representation while recognizing the demographic weight of different areas. The number of respondents per district was as follows: Tabora Urban had 57

participants, Urambo had 44, Tarime had 59, Musoma Rural had 40, Tanga Municipal had 26, Mkinga had 52, Lindi Urban had 30, Kilwa had 39, Njombe Town had 25, and Njombe District Council also had 25. This distribution ensured sufficient variability for comparative and disaggregated analysis.

3.3 Data collection

Data collection was conducted using a mixed-methods approach that combined structured household surveys with qualitative focus group discussions. The quantitative component involved administering a structured questionnaire to all 397 participants across the ten districts. The survey was conducted in Swahili by trained enumerators and covered a range of themes relevant to emotional well-being, cognitive life satisfaction, and social capital, alongside basic demographic and socio-economic information.

To complement and contextualize the survey data, one focus group discussion was conducted in each of the five regions. Each group consisted of 8 to 10 participants selected to reflect variation in gender, age, and socio-economic status. These discussions were held in Swahili and facilitated by experienced moderators using a semi-structured guide. Thematic areas explored during the discussions included perceptions of happiness and life satisfaction, community relationships, social expectations, economic pressures, and aspirations. All sessions were recorded and transcribed for qualitative analysis.

3.4 Data analysis and methodological approach

This study employed both quantitative and qualitative methods to comprehensively examine the interplay between emotional well-being, cognitive life satisfaction, and social capital within diverse Tanzanian communities. The quantitative data were analyzed using a multi-stage statistical approach aimed at aligning directly with the study's three specific research objectives.

For Objective 1, descriptive statistics and bivariate analyses were conducted to explore the distribution of positive affect (PA) and life satisfaction (LS) scores across socio-demographic groups such as age, gender, education level, urban-rural residence, and

income category. The Positive and Negative Affect Schedule (PANAS) was used to derive separate indices for positive and negative emotions, while the Satisfaction With Life Scale (SWLS) captured global cognitive well-being. Pearson correlations were used to assess the linear relationship between PA and LS. Group differences were examined using t-tests or ANOVA, depending on the number of comparison groups. This allowed for an initial understanding of how emotional and cognitive well-being vary across demographic contexts.

To address Objective 2, multivariate linear regression models were employed to assess the predictive power of various dimensions of social capital on both positive affect and life satisfaction. Independent variables included multiple constructs measured through the survey: interpersonal trust, community engagement, social support, network size, perceived reciprocity, and burdens of social obligations. These variables were treated either as composite indices or factor scores derived from exploratory factor analysis (EFA) where necessary, to reduce dimensionality and ensure construct validity. Control variables included key demographic and socio-economic characteristics (e.g., gender, income, marital status, education, health status, and urban/rural setting). Separate models were run for PA and LS to isolate the effects of social capital on emotional versus evaluative well-being.

For Objective 3, moderation analysis was conducted to explore whether social capital buffers or amplifies the relationship between positive affect and life satisfaction. Interaction terms were created between the PA index and selected social capital dimensions (e.g., trust, social support, network size). These were added to the life satisfaction model to test for statistically significant moderating effects. A significant interaction term would suggest that the relationship between emotional well-being and life satisfaction varies depending on levels of social capital. All models were tested for multicollinearity, normality of residuals, and heteroscedasticity to ensure reliability and robustness.

Qualitative data from focus group discussions were transcribed, translated (where necessary), and analyzed thematically using a deductive-inductive coding framework. Initial codes were based on the thematic categories explored in the discussions—such

as happiness, social support, social comparison, and communal pressures—while allowing for emergent codes that reflected unanticipated yet relevant insights. Thematic synthesis was then used to triangulate and contextualize the quantitative findings, particularly regarding the subjective interpretation of well-being, the double-edged nature of social capital, and the lived experience of social expectations.

This mixed-methods approach provided a multidimensional understanding of well-being in Tanzanian communities. By linking validated psychometric scales with rich qualitative narratives, the study was able to not only quantify patterns of well-being and social capital, but also to interpret them within the unique cultural and communal contexts in which they occur.

Qualitative data from focus group discussions were analyzed using thematic analysis. Transcripts were coded both deductively, based on the survey's conceptual framework, and inductively, allowing new themes to emerge from participants' narratives. This qualitative layer provided depth and contextual understanding to the quantitative findings, enabling more comprehensive interpretations.

3.5 Summary statistics

The final sample included 397 respondents from ten districts across five regions and five major zones of Tanzania Mainland. The sample was balanced between rural and urban areas and reflected a broad mix of ages, education levels, household types, and economic backgrounds. This diversity provided a solid foundation for analyzing the relationships between emotional well-being, life satisfaction, and social capital across different community settings in Tanzania.

Table 11 presents summary statistics for key demographic, social, and economic variables collected from respondents across five regions. These statistics offer foundational insights into the composition of the study sample, including averages (means), variability (standard deviations) and the range (minimum and maximum values) for each variable. This information is essential for contextualizing subsequent analyses on subjective well-being, social capital and life satisfaction. We

have grouped the variables into three categories, demographic, social and economic, to align with the study's analytical framework.

Table 1. Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
A: Demographic					
Age	397	41.2	13.109	18	80
Female	397	.668	.472	0	1
Household size	397	5.637	4.148	1	42
Number of dependents under 18	397	2.443	2.272	0	30
Number of elderly dependents (60+)	397	.345	.700	0	6
Rural	397	0.511	.501	0	1
B: Social					
Marital status					
Single	397	.179	.384	0	1
Married	397	.529	.500	0	1
Divorced	397	.108	.311	0	1
Widowed	397	.083	.276	0	1
In a relationship, not married	397	.101	.301	0	1
Education level					
No formal education	397	.111	.314	0	1
Primary school	397	.587	.493	0	1
Secondary school	397	.217	.412	0	1
Some university/college education	397	.010	.100	0	1
Vocational training	397	.065	.248	0	1
University degree	397	.010	.100	0	1
Health status (subjective)					
Excellent	397	.151	.359	0	1
Good	397	.534	.499	0	1
Fair	397	.229	.421	0	1
Poor	397	.013	.112	0	1
Chronic health condition	397	.073	.261	0	1
Religion					
Christian	397	.521	.500	0	1
Muslim	397	.466	.499	0	1
No religious affiliation	397	.013	.112	0	1
C: Economic					
Household income (monthly)					
Less than 100,000 Tanzanian Shillings	397	.466	.499	0	1
100,000 to 500,000 Tanzanian Shillings	397	.466	.499	0	1

500,000 to 1,000,000 Tanzanian Shilling	397	.058	.234	0	1
More than 1,000,000 Tanzanian Shillings	397	.010	.100	0	1
Employment status					
Employed (formal sector)	397	.033	.178	0	1
Employed (informal sector/self-employed)	397	.806	.396	0	1
Unemployed (actively looking for work)	397	.025	.157	0	1
Homemaker (housewife / husband)	397	.076	.265	0	1
Other (mason, tailor, mechanic)	397	.020	.141	0	1
Occupation					
Agriculture (Farming / Animal Keeping)	333	.357	.480	0	1
Small business/trade/self-employed	333	.462	.499	0	1
Casual laborer / day worker	333	.051	.220	0	1
Government / Public service	333	.018	.133	0	1
Others (guard, hotel employee, factory worker)	333	.066	.249	0	1

The average age of respondents was 41.2 years (SD = 13.1), with ages ranging from 18 to 80 years, indicating a diverse adult sample suitable for examining well-being across life stages. The sample was predominantly female, with 66.8% of respondents identifying as women, probably due to higher female presence at home during interviews. The average household consisted of 5.6 members, which is typical in extended family settings, though some households were exceptionally large (up to 42 members), suggesting polygamous or intergenerational living arrangements. Regarding caregiving responsibilities, households had an average 2 children under the age of 18 and 0.35 elderly dependents aged 60+ (SD = 0.70), with a maximum of 6. While most households did not report caring for elderly members, the presence of older dependents in some households points to a caregiving role that could influence household stress, time allocation, and emotional well-being. Moreover, 51.1% of respondents lived in rural areas, revealing a relatively balanced urban-rural representation in the sample.

In terms of marital status, 52.9% of respondents were married, while 17.9% were single. Others were divorced (10.8%), widowed (8.3%) or in non-marital relationships (10.1%). This suggests that most individuals are in formal unions. Education levels were generally low, with 58.7% having only primary education and 21.7% completing secondary school. Only a small fraction, 1.0%, had higher education with university degrees and another 1.0% having attended some university or college. Vocational training was reported by 6.5%, and 11.1% of respondents had no formal education at all. This educational profile may affect respondents' employment prospects, health literacy and ability to access services.

Health-wise, a majority of participants perceived themselves to be in good (53.4%) or excellent (15.1%) health, although 22.9% rated their health as fair and 1.3% as poor. Around 7.3% reported living with a chronic condition, which may affect daily functioning and well-being. In terms of religious affiliation, 52.1% identified as Christian and 46.6% as Muslim, with only 1.3% reporting no religious affiliation. This indicates a near-equal distribution between the two major religions in the country.

The income profile reveals high economic vulnerability. Nearly all respondents (93.2%) reported earning less than 500,000 Tanzanian shillings per month, split equally between those earning under 100,000 and those earning between 100,000 and 500,000. Only 5.8% earned between 500,000 and 1,000,000 shillings, and just 1.0% reported earning more than 1,000,000. This indicates widespread low income and a narrow upper-income tier.

Employment patterns were dominated by informal work, 80.6% of respondents were self-employed or working in the informal sector. Only 3.3% held formal sector jobs, and 7.6% were homemakers. A small fraction (2.5%) were unemployed but actively seeking work, while 2.0% were engaged in other forms of work like tailoring or masonry. Among those employed, the most common occupations were in small business or petty trade (46.2%) and agriculture (35.7%). Casual laborers made up 5.1%, while public servants constituted just 1.8%. Other occupations, such as hotel or factory workers, accounted for 6.6%. This suggests a predominantly informal economy, with limited access to stable employment or benefits.

4 Results and Discussion

4.1 Positive and negative affect (PANAS)

To explore respondents' momentary emotional well-being, we employed the Positive and Negative Affect Schedule (PANAS). The PANAS instrument includes two dimensions: positive affect and negative affect. We used a shortened 10-item version of the PANAS scale, adapted from the original by Watson, Clark, and Tellegen (1988), comprising 5 positive and 5 negative affect items. The positive affect scale captures uplifting emotional states such as Enthusiastic, Active, Alert, Inspired and Excited, while the negative affect scale measures distressing emotions such as Upset, Irritable, Afraid, Nervous and Ashamed. Respondents were asked to rate how frequently they experienced each emotion during the past week on a five-point Likert scale ranging from "Very slightly or not at all" to "Extremely." This dual framework enables a comprehensive understanding of the emotional tone of daily life, distinguishing between the presence of positive emotions and the absence or presence of distress. The following results present overall descriptive patterns in both emotional dimensions, offering insight into the affective side of subjective well-being.

Figure 1. Positive affects

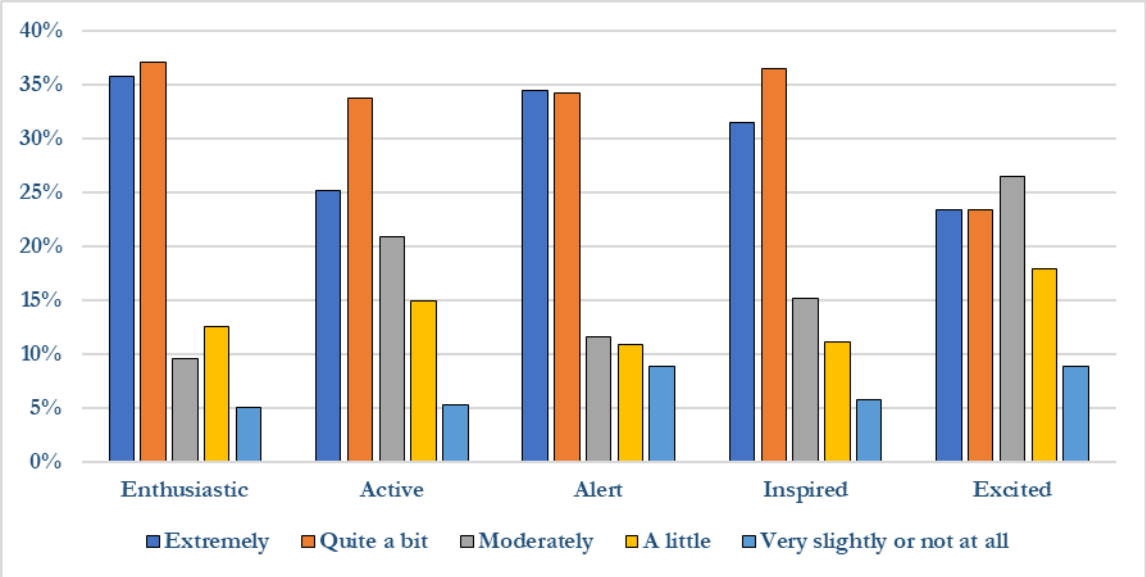


Figure 1 presents the distribution of responses to five positive affect items measured on a five-point Likert scale. Overall, the findings reveal a strong presence of positive

emotional states among respondents, with the majority selecting either “Quite a bit” or “Extremely” across all emotions. Notably, Enthusiastic and Inspired were among the most intensely felt emotions, with over 70% of respondents indicating high levels of these feelings. Alertness also scored high, suggesting widespread mental engagement and attentiveness. While Excitement was still relatively common, it showed a broader spread across response categories, indicating a slightly more tempered emotional experience. These findings reinforce the pattern identified in African well-being research, individuals often report frequent momentary happiness and emotional vitality, even when facing structural limitations that lower their long-term life satisfaction.

Figure 2. Negative affects

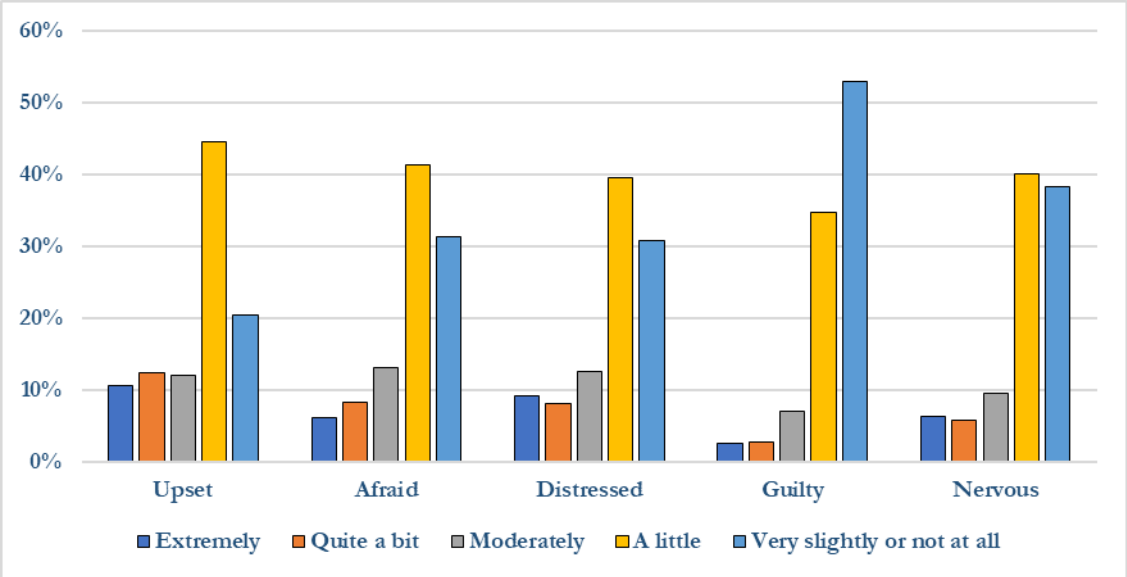


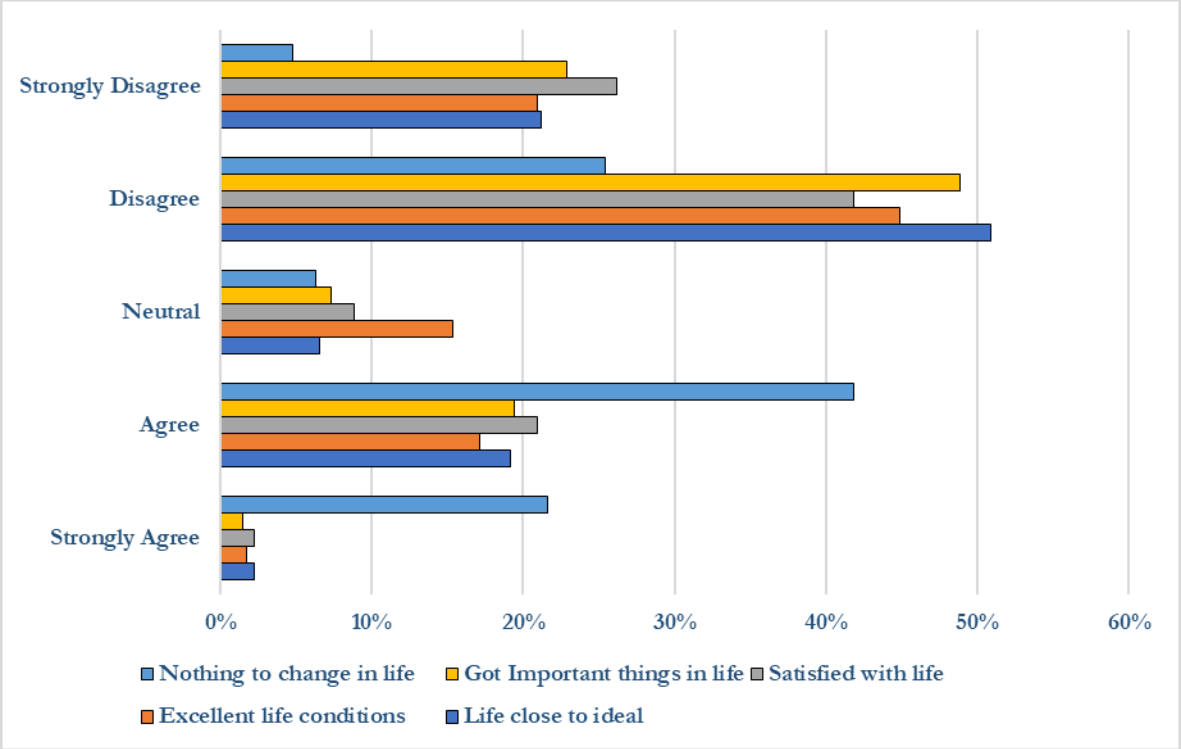
Figure 2 summarizes responses to the Negative Affect scale reveals that most respondents experienced low to moderate levels of distress over the past week. Across emotions, the majority of participants reported feeling these emotions either “a little” or “very slightly or not at all.” For instance, over 40% felt “a little” upset or afraid, while more than half reported feeling little to no guilt, making it the least prevalent negative emotion. Intense emotional responses (rated “Extremely”) were rare across all categories. These findings suggest that although respondents occasionally encountered stressors, they did not report high levels of psychological distress. This

emotional profile reflects the potential buffering role of social support networks in managing daily emotional burdens.

4.2 Life satisfaction

We used the Satisfaction With Life Scale (SWLS) adopted from Diener et al., (1985) to measure individuals' overall evaluation of their lives. Unlike affective measures that capture momentary emotional states, the SWLS focuses on long-term perceptions, including fulfilment and contentment. Respondents completed the Satisfaction with Life Scale (SWLS), rating five statements — *"In most ways, my life is close to my ideal," "The conditions of my life are excellent," "I am satisfied with my life," "So far, I have gotten the important things I want in life," and "If I could live my life over, I would change almost nothing"* — on a five-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). This scale provides valuable insight into how individuals perceive the quality and direction of their lives beyond day-to-day emotions.

Figure 3. Life satisfaction



The life satisfaction results reveal a pronounced pattern of cognitive discontent among respondents. Figure 3 presents a clear picture of overall dissatisfaction with life

among respondents. The majority expressed negative evaluations across multiple dimensions, including the sense that their life is close to ideal, satisfaction with life, excellent living conditions, and having achieved important things in life. For each of these items, less than a quarter of respondents expressed agreement, with only 2% strongly agreeing and between 17% and 21% agreeing. In contrast, disagreement was markedly high: between 42% and 51% of respondents disagreed with these positive statements, and an additional 21% to 26% strongly disagreed, particularly regarding overall life satisfaction. A notable exception appears in the statement "Nothing to change in life," where 22% strongly agreed and 42% agreed—suggesting that despite general dissatisfaction, some respondents may feel acceptance or resignation toward their current circumstances. Overall, these findings indicate a dominant pattern of cognitive discontent, reflecting low long-term evaluations of life quality despite possible short-term or emotional positives.

4.3 Social Capital

To explore how community relationships influence subjective well-being, we examined multiple dimensions of social capital, including trust, reciprocity, communal support and participation in social networks. Social capital reflects the strength and quality of individuals' connections within their community and has been widely recognized as a key driver of emotional resilience and shared coping mechanisms, especially in low-resource settings. The survey included both positive elements, such as perceived help from neighbors and participation in community events, and negative aspects, like distrust and being alert in the neighborhood. This subsection presents findings that illuminate the dual role of social capital: as a source of emotional support and collective identity, but also as a potential contributor to stress and diminished life satisfaction.

Figure 4. Social capital

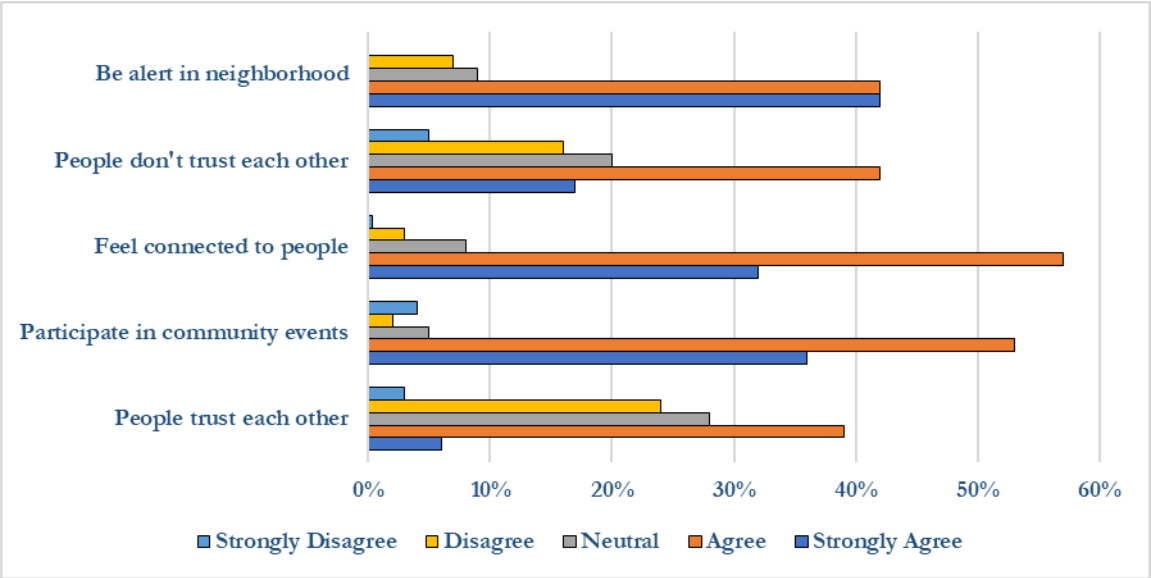


Figure 4 illustrates respondents' perceptions of trust, social connectedness, and community participation, which are key components of social capital. Overall, the responses show a strong sense of community engagement and cohesion. The majority of respondents agreed or strongly agreed that they feel connected to others (over 50%) and actively participate in community events (just under 50%). These results suggest that communal life plays a significant role in people's daily experiences, reinforcing a sense of belonging and shared purpose. Perceptions of trust, however, were more complex. While around 40% of respondents agreed that "people trust each other," a similar proportion also agreed with the contradictory statement that "people don't trust each other." This ambivalence indicates that trust may be context-dependent, strong within close networks but weaker in broader community settings. In contrast, the statement "Be alert in the neighborhood" also received high agreement, with nearly half of respondents indicating that caution is needed in their surroundings. This suggests that despite feeling socially connected and engaged, many community members remain vigilant and perceive a need for personal or household-level security.

4.4 Social capital and potential burdens

While social capital often offers emotional support and a sense of belonging, it can also impose significant demands on individuals. This study explored not only the benefits but also the burdens of social relationships, such as the pressure to attend

communal events, contribute financially or conform to social expectations. These obligations, though rooted in solidarity, can strain household resources and individual well-being. This subsection highlights the extent to which social connectedness, when accompanied by obligatory participation, may contribute to emotional stress and lower life satisfaction.

Figure 5. Social capital potential burdens

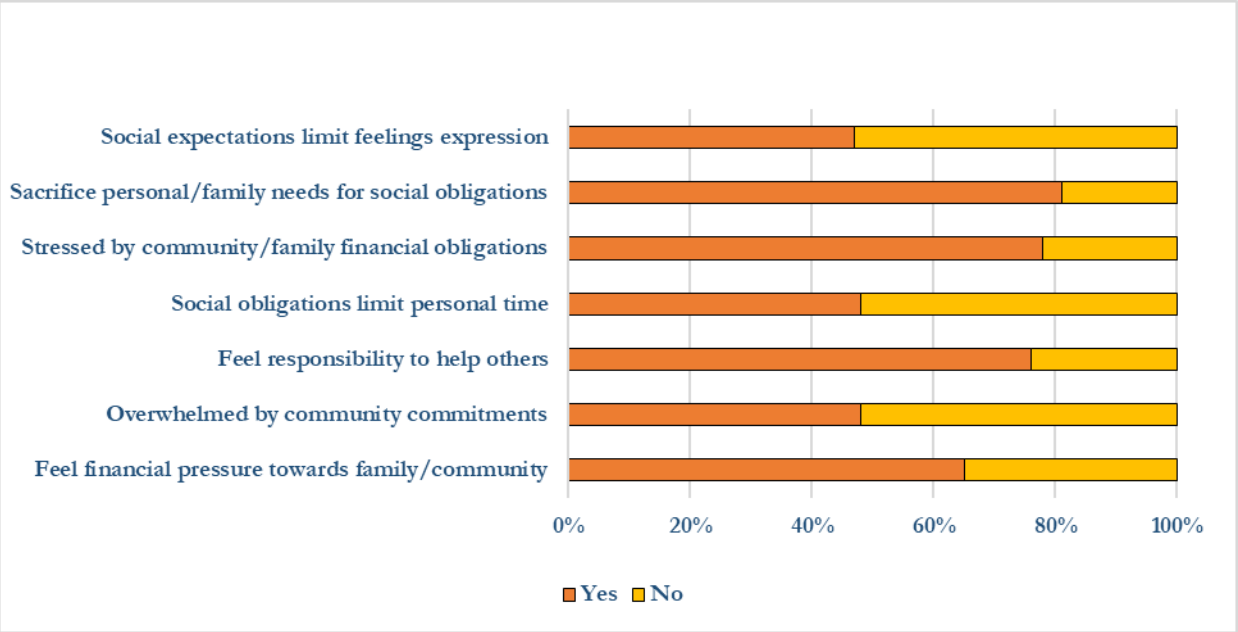


Figure 5 shows that while social relationships are central to communal life, they can also impose significant burdens on individuals. A majority of respondents reported feeling financial pressure from family or community obligations, with over 70% noting stress due to such commitments. Many admitted to sacrificing personal or family needs and time to fulfill communal expectations. Moreover, about half felt that social expectations limited their ability to openly express emotions, and more than half felt overwhelmed by community responsibilities. These insights indicate the paradox of social capital in the study context, although it offers emotional and practical support, it can also become a source of psychological and economic strain, particularly when social conformity and obligation outweigh individual well-being.

4.5 Regression analyses of social capital, positive affect, and life satisfaction

The regression analyses provide deeper insights into the complex ways in which social capital interacts with emotional well-being and life satisfaction in Tanzanian communities. Table 2 reports the results of two OLS models predicting life satisfaction (SWLS) and positive affect (PA) using different dimensions of social capital as predictors.

Table 2. OLS results for life satisfaction and positive affect on social capital

Variables	(1) SWLS Reg	(2) PA Reg
trust_reciprocity_score	0.991***	-0.703***
	(0.184)	(0.247)
support_network_score	-0.339*	0.473**
	(0.177)	(0.238)
community_engagement_score	-0.909***	-0.007
	(0.199)	(0.268)
social_burden_score	0.235	1.042***
	(0.187)	(0.252)
Controls	YES	YES
Constant	15.743***	9.596***
	(1.404)	(1.892)
Observations	397	397
R-squared	0.321	0.281

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The results reveal a complex and sometimes paradoxical relationship between social capital and well-being outcomes. Trust and reciprocity significantly and positively predict life satisfaction, suggesting that dependable and trustworthy social ties play a critical role in enhancing individuals' long-term evaluations of life. Interestingly, however, the same variable negatively predicts positive affect, pointing to the possibility that maintaining trust-based relationships may require effort and vigilance that dampens immediate emotional states. Support networks, in contrast, positively predict positive affect but negatively affect life satisfaction. This pattern suggests that while receiving and offering support boosts daily emotional vitality, the long-term strain of reciprocal obligations may undermine overall life evaluations. Community engagement also demonstrates an adverse effect, reducing life satisfaction without

influencing positive affect. This indicates that while participating in communal events reinforces belonging, it may simultaneously impose obligations and pressures that lower satisfaction. Finally, social burdens do not significantly affect life satisfaction but positively predict positive affect, highlighting that fulfilling obligations may provide short-term emotional benefits, such as pride or social recognition, but not lasting life contentment.

Table 3. OLS results for life satisfaction on positive affect and the mediating effect of trust

Variables	(1) SWLS_PA Reg	(2) SWLS_Inter PA_Trust
PA	-0.082**	-0.034
	(0.041)	(0.040)
trust_reciprocity_score		1.407***
		(0.454)
c.PA#c.trust_reciprocity_score		-0.014
		(0.037)
Controls	YES	YES
Constant	18.267***	17.133***
	(1.511)	(1.442)
Observations	397	397
R-squared	0.178	0.271

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3 further examines the relationship between positive affect and life satisfaction while considering the role of trust as a mediating or moderating factor. In the baseline model, positive affect is negatively associated with life satisfaction, implying that frequent experiences of positive emotions do not necessarily translate into higher life evaluations in the Tanzanian context. However, once trust and reciprocity are introduced into the model, they emerge as a strong positive predictor of life satisfaction, while the effect of positive affect diminishes and becomes statistically insignificant. This shift suggests that trust-based social capital mediates the relationship between affect and life satisfaction, absorbing the explanatory power previously attributed to emotional states. The interaction term between positive affect

and trust is negative but non-significant, indicating that trust does not moderate but rather mediates the link between emotional well-being and cognitive evaluations of life. These results reinforce the idea that in contexts where communal ties and trust are central to social functioning, trust plays a pivotal role in shaping life satisfaction, even more than emotional experiences themselves.

5 Discussion

The findings of this study highlight the double-edged nature of social capital in shaping well-being. While trust and reciprocity appear as unambiguously beneficial for life satisfaction, other dimensions such as support networks, communal engagement, and social obligations produce more complex and sometimes contradictory effects. These results resonate with prior studies showing that social capital in low- and middle-income settings can provide resilience and emotional support but may also generate economic pressures and emotional strain (Makiwane et al. 2021). The negative association between support networks and life satisfaction, for instance, may reflect the "costs of belonging," where individuals who rely heavily on social support face high expectations of reciprocity that ultimately undermine cognitive evaluations of their lives.

The mediating role of trust in the relationship between positive affect and life satisfaction emphasizes the importance of context-specific interpretations of well-being. In high-income countries, positive affect is often positively associated with life satisfaction (Lyubomirsky et al., 2005), but in Tanzania, this relationship appears weaker or even negative unless embedded in a context of trust. This suggests that the cultural and social context determines how emotional experiences translate into life evaluations. In communities where trust is the glue of social life, individuals may require stable, trustworthy relationships to make sense of and sustain their positive emotional experiences.

Another important contribution of this study is the distinction between emotional vitality and cognitive satisfaction. The findings show that Tanzanians report relatively high levels of positive affect but low levels of life satisfaction. This divergence mirrors insights from the World Happiness Report (Helliwell et al., 2023), which notes

that people in resource-constrained settings often maintain emotional positivity through social connectedness and resilience, even as structural barriers limit life evaluations. The coexistence of emotional vitality with cognitive discontent suggests that policies aimed at improving well-being must address both immediate emotional resources (such as social support and networks) and long-term structural conditions (such as education, income, and trust-building institutions).

6 Conclusion

This study investigated the interplay between positive affect, life satisfaction, and social capital across diverse Tanzanian communities. The findings reveal a paradox: respondents frequently experienced positive emotional states yet expressed low overall life satisfaction. This divergence highlights that emotional well-being and cognitive evaluations are not interchangeable but distinct dimensions of subjective well-being.

The results also demonstrate that social capital is not uniformly beneficial. Trust and reciprocity consistently enhance life satisfaction, highlighting their importance in cognitive evaluations of life. Other forms of social capital, such as support networks and community engagement, exert mixed effects—boosting short-term positive emotions but lowering long-term life satisfaction due to obligations and pressures. Regression analyses further confirmed that trust mediates the relationship between positive affect and life satisfaction, positioning trust as a key mechanism through which emotions translate into evaluations of life quality.

For policy, the implications are clear. Initiatives to strengthen community trust and reciprocity should be prioritized as they directly improve life satisfaction. At the same time, interventions must address the burdens of social obligations by creating institutional safety nets that reduce the reliance on informal reciprocity. By doing so, policies can enhance both the emotional vitality and the cognitive satisfaction of Tanzanians, advancing a more holistic approach to well-being in development contexts.

References

Alkire, S. (2016). The capability approach and well-being measurement for public policy. In M. D. Adler & M. Fleurbaey (Eds.), *The Oxford handbook of well-being and public policy*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199325818.013.18

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Diener, E., Oishi, S., & Lucas, R. E. (2015). National accounts of subjective well-being. *American psychologist*, 70(3), 234-242. https://psycnet.apa.org/buy/2015-14441-002

Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour, 2*(4), 253–260. https://doi.org/10.1038/s41562-018-0307-6

Helliwell, J. F., Layard, R., Sachs, J. D., De Neve, J.-E., Aknin, L. B., & Wang, S. (Eds.). (2023). *World Happiness Report 2023*. New York: Sustainable Development Solutions Network. WHR23.pdf

Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society B: Biological Sciences, 359*(1449), 1435–1446. https://doi.org/10.1098/rstb.2004.1522

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*(6), 803–855. https://doi.org/10.1037/0033-2909.131.6.803

Moser, C. O. N. (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development, 26*(1), 1–19. https://doi.org/10.1016/S0305-750X(97)10015-8

Narayan, D., & Pritchett, L. (1999). Cents and sociability: Household income and social capital in rural Tanzania. *Economic Development and Cultural Change, 47*(4), 871–897. https://doi.org/10.1086/452436

Putnam, R. D. (2000). *Bowling Alone: The collapse and revival of American community*. Simon & Schuster. https://doi.org/10.1145/358916.361990

Tiliouine, H., Cummins, R. A., & Davern, M. (2009). Islamic religiosity, subjective well-being, and health. *Mental health, religion & culture*, *12*(1), 55-74. https://doi.org/10.1080/13674670802118099

Makiwane, M., Gumede, N. A., Makoae, M., & Vawda, M. (2017). Family in a changing South Africa: structures, functions and the welfare of members. *South African Review of Sociology*, *48*(2), 49-69. https://doi.org/10.1080/21528586.2017.1288166

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Woolcock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research, and policy. *The World Bank Research Observer, 15*(2), 225–249. https://doi.org/10.1093/wbro/15.2.225

1 Introduction

Improving well-being is a critical agenda both globally and locally, as nations seek to enhance the quality of life for their populations and promote sustainable development. At the core of this global effort is Sustainable Development Goal (SDG) 3, which seeks to "ensure healthy lives and promote well-being for all at all ages." This goal emphasizes the importance of access to quality healthcare, healthy lifestyles, and the prevention of health-related risks, with the broader aim of improving overall human welfare. However, this objective cannot be fully achieved without addressing other interconnected SDGs that target the root causes of inequality and deprivation. SDG 1 (No Poverty), SDG 2 (Zero Hunger), and SDG 8 (Decent Work and Economic Growth) all contribute to enhancing well-being by focusing on economic empowerment, access to basic needs, and reducing disparities. In particular, the relationship between SDG 2—"End hunger, achieve food security and improved nutrition, and promote sustainable agriculture"—and SDG 3 is especially significant in developing countries, where both food insecurity and poor health outcomes are prevalent. In these regions, achieving food security is not only an economic necessity but also a fundamental aspect of enhancing human well-being.

Food security, defined as consistent access to sufficient, safe, and nutritious food for an active and healthy life, is a crucial factor in promoting individual and societal welfare. It encompasses several dimensions, including the availability, accessibility, quality, and stability of food, all of which directly affect people's physical health, economic productivity, and life satisfaction (FAO, 1996). Yet, while traditional economic measures of development—such as income and consumption—are often used to gauge well-being, they fail to capture the multifaceted nature of human welfare. Concurrently, Subjective well-being (SWB) reflects individuals' evaluations of their own lives, encompassing both cognitive judgments of life satisfaction and affective experiences of happiness and emotional balance (Diener et al., 1999). Understanding the factors that contribute to SWB is crucial for informing policies and interventions

aimed at improving individual and societal welfare and promoting sustainable development.

Recent studies highlight a significant relationship between food insecurity and lower SWB, especially in low- and middle-income countries Kornher and Sakketa (2021. Individuals experiencing food insecurity often report heightened levels of stress, anxiety, and diminished life satisfaction. These psychological and emotional burdens, compounded by the physical health consequences of malnutrition, create a profound impact on overall well-being (Kornher and Sakketa, 2021; Sulemana and James, 2019). While these negative effects are more pronounced in developing regions, the relationship between food insecurity and SWB also varies depending on local economic factors, such as income levels, food prices, and perceptions of fairness in food distribution. In developed countries, for example, food insecurity may have a greater psychological impact due to higher expectations of living standards (Frongillo et al., 2018). These studies highlight the context-specific nature of the relationship between food security and SWB.

Furthermore, economic factors such as food price inflation and access to stable income play a crucial role in shaping food security and, by extension, SWB. The affordability and accessibility of food directly influence whether households can meet their nutritional needs, with rising food prices exacerbating food insecurity, particularly among low-income groups. Aspiration theory also suggests that unmet aspirations related to income and food security can negatively affect well-being. Individuals whose aspirations remain unfulfilled due to limited access to resources may experience a decline in life satisfaction, especially when these aspirations are central to their sense of security and well-being (Mekonnen and Gerber, 2016).

This paper contributes to the growing body of literature by exploring the complex ways in which food security influences subjective well-being, particularly in developing countries. It examines the interplay between food security, income, and aspirations, and how these factors collectively shape individuals' experiences of well-being. By examining these dimensions, this study seeks gain a deeper understanding of the

complex relationship between food security and well-being, and consider potential policy implications for improving both in vulnerable populations.

2 Literature Review

A growing body of literature highlights the critical role that food security plays in subjective well-being (SWB). Traditional economic models often equate welfare with utility derived solely from consumption, assuming that an increase in material wealth directly leads to improved well-being. However, this approach overlooks the psychological consequences of food insecurity, including the uncertainty and fear about the future, which can significantly affect an individual's mental and emotional state (Stutzer, 2010). Researchers argue that the psychological impacts of food insecurity—such as stress, anxiety, and a sense of helplessness—must be considered when evaluating well-being, as these factors can be as important, if not more so, than material factors in determining overall quality of life.

Empirical studies consistently demonstrate a strong negative correlation between food insecurity and SWB across a variety of contexts, particularly in regions such as Sub-Saharan Africa. For instance, research by Kornher and Sakketa (2021) and Sulemana and James (2019) finds that individuals facing food insecurity tend to report significantly lower levels of life satisfaction. This finding suggests that food insecurity is a key determinant of well-being, influencing individuals' ability to lead fulfilling, stable lives.

Several factors contribute to the negative relationship between food insecurity and SWB. One of the most significant is the detrimental impact of food insecurity on physical health. Lack of access to sufficient, nutritious food increases vulnerability to illness and malnutrition, which can exacerbate feelings of hopelessness and despair (Kornher and Sakketa, 2021). Moreover, the constant worry about securing enough food for oneself and one’s family can lead to chronic psychological distress, manifesting as stress, anxiety, and depression. These emotional burdens compound the negative effects of food insecurity on overall well-being, creating a vicious cycle that is difficult to break.

The negative impact of food insecurity on SWB may be more pronounced in wealthier, more developed countries. Frongillo et al. (2018) suggest that this discrepancy could be explained by the concept of "hedonic adaptation," where individuals in low-income countries, accustomed to persistent food insecurity, have adjusted their expectations and life satisfaction benchmarks. In contrast, individuals in higher-income countries, who are more accustomed to food security, may experience a more significant decline in SWB when faced with food scarcity. This phenomenon stresses the psychological complexity of food insecurity, which varies not just by income levels but also by individuals' relative expectations.

Beyond individual experiences, the broader distribution of food within a country also has implications for SWB. Perceptions of unfair food distribution—where certain groups or regions have disproportionately less access to food—can lead to feelings of injustice and inequality, which detract from overall life satisfaction (Kornher and Sakketa, 2021). Even those who are not directly affected by food insecurity may experience diminished well-being if they perceive food distribution as inequitable.

The relationship between food security and SWB is further complicated by economic factors such as food price inflation. Research indicates that rising food prices can exacerbate food insecurity, particularly among low-income households, leading to a direct decline in well-being (Alem and Köhlin, 2014). This reinforces the idea that economic conditions and food access are deeply intertwined in shaping subjective well-being.

Another important dimension of the food security and well-being relationship is the aspiration failure framework. This framework suggests that unmet aspirations, particularly in contexts of poverty and deprivation, can significantly affect well-being. Research in Ethiopia (Mekonnen and Gerber, 2016) shows that aspirations are closely linked to SWB outcomes. Individuals whose aspirations remain unfulfilled due to constraints such as low income or limited access to food are more likely to experience a decline in well-being. Furthermore, aspirations themselves can influence both income and food security status, as individuals with higher aspirations may pursue better-paying jobs or more stable food sources. However, when these aspirations are

not realized, it can lead to feelings of frustration and lower life satisfaction. In this way, aspirations not only shape well-being directly but also mediate the impact of food security and income on SWB.

The literature consistently shows a strong negative correlation between food insecurity and subjective SWB, with food insecurity affecting physical health, psychological distress, and social perceptions of fairness. Economic factors like food price inflation and aspirations further complicate this relationship. My study contributes to this body of literature by exploring the complex pathways through which food security impacts SWB, specifically examining how aspirations, income, and food security status interact to shape well-being, particularly in developing countries.

3 Methodology

3.1 Data and descriptive statistics

This study utilizes data from the 7th to 10th waves of the Tanzania High Frequency Welfare Monitoring Phone Survey (HFWMPS), which includes information on subjective well-being (SWB). The HFWMPS is conducted by the National Bureau of Statistics (NBS) of Tanzania, with technical and financial support from the World Bank. Each wave of the survey includes a set of key indicators and is designed to be completed in approximately 20 minutes. The survey is administered bi-monthly over a period of 2-3 weeks.

The HFWMPS sample is drawn from households that participated in previous face-to-face surveys, including the National Panel Survey (NPS) 2014/15, the Mainland Household Budget Survey (HBS) 2018, and the Zanzibar HBS 2019/20. Most households in these surveys provided phone numbers, which were used to re-contact participants for the HFWMPS. The primary sample frame for the HFWMPS is the NPS, supplemented by the Mainland and Zanzibar HBS samples.

Each monthly wave targets a sample size of approximately 3,000 households. To achieve this target, a larger pool of households is selected due to common issues of non-contact and non-response in telephone surveys. In practice, the number of households successfully contacted in each wave was as follows: 2,160 in Wave 7,

2,093 in Wave 8, 2,033 in Wave 9, and 1,981 in Wave 10. Across all four waves, a total of 1,721 households were consistently contacted and completed the survey, forming a balanced panel for analysis.

The survey respondents were divided into two subsamples, each receiving a distinct set of questions. Some questions were asked of both subsamples, while others were specific to one subsample. Specifically, the questions related to SWB and food security were alternated between the two subsamples. For example, if Subsample B answered questions on SWB and food security in Wave 7, these same questions would be repeated in Wave 9, but would not be asked in Waves 8 and 10. This alternating structure allowed for a more robust collection of data while minimizing respondent fatigue and ensuring diverse data coverage over time. In essence, each household contributed two time points of data, enabling a more robust panel data analysis.

The summary statistics in Table 1 offers detailed insights into the various variables collected in the Tanzania HFWMPS, with a focus on subjective well-being (SWB) and food security, as well as demographic and economic indicators.

Table 1. Summary statistics

	N	Mean	SD	Min	Max
SWB on food (Inadequate=1)	3440	.42	0.49	0	1
SWB on health (Inadequate=1)	3440	.28	0.45	0	1
SWB on income (Fair=1)	3440	.08	0.27	0	1
SWB general (Happy=1)	3440	.83	0.37	0	1
Worried about food (Yes=1)	3440	.5	0.50	0	1
Unable to eat healthy (Yes=1)	3440	.55	0.50	0	1
Ate few kinds of food (Yes=1)	3440	.5	0.50	0	1
Skipped meal (Yes=1)	3440	.43	0.49	0	1
Ate less food (Yes=1)	3440	.39	0.49	0	1
Ran out of food (Yes=1)	3440	.21	0.41	0	1
Hungry but didn't eat (Yes=1)	3440	.25	0.43	0	1
Didn't eat whole-day (Yes=1)	3440	.14	0.35	0	1
Food insecurity index	3440	-.01	2.25	-2.78	4.74

Age of respondent (years)	3440	51.05	12.91	22	100
Household size	3440	6.08	3.09	1	24
Sex of respondent (Male=1)	3440	.76	0.43	0	1
Location (Rural=1)	3440	.63	0.48	0	1
Price maize flour	2383	1758.04	468.88	500	15000
Price rice	3236	2567.26	717.23	1200	28000
Price beans	2943	2999.41	795.71	800	30000
Price beef	2771	8399.03	1381.72	1000	14000
Maize flour available (Yes=1)	3440	0.88	0.32	0	1
Rice available (Yes=1)	3440	0.99	0.10	0	1
Beans available (Yes=1)	3440	0.98	0.14	0	1
Beef available (Yes=1)	3440	0.90	0.31	0	1

The general SWB score is high at 0.83, indicating high overall life satisfaction. However, in specific areas, such as health, food security, and income, the results vary. Health-related SWB has a mean of 0.28, showing 76% of respondents are satisfied while for food security, 58% are satisfied (mean = 0.42). The income-related SWB is notably low, with only 8% of respondents feeling their income is fair, reflecting significant dissatisfaction. These findings highlight that while general happiness is relatively high, specific areas like food security, and income remain key challenges for many individuals.

Several indicators related to food insecurity suggest that many households face significant challenges. For instance, half of the respondents (mean = 0.50) report being worried about food, and over half (mean = 0.55) report being unable to eat healthy. Other indicators, such as skipping meals (mean = 0.43), eating fewer kinds of food (mean = 0.50), and eating less food (mean = 0.39), highlight the frequency of food insecurity-related behaviors. These results are further emphasized by the food insecurity index, which has a mean of -0.01, with a wide range from -2.78 to 4.74, indicating significant variability in food insecurity across the sample.

Demographic factors reveal that the average respondent is 51.05 years old, with a household size of 6.08. The sample is predominantly male (76%) and rural (63%), which is notable since food insecurity tends to be more pronounced in rural areas due to limited access to resources and infrastructure.

On the economic side, food prices show considerable variation. The price of maize flour is relatively low (mean = 1,758 TZS), while beef is much more expensive (mean = 8,399 TZS). High prices will likely exacerbate food insecurity, especially for low-income households. Regarding food availability and accessibility, basic staples like rice (99% availability) and maize flour (88% availability) are generally accessible to most respondents.

3.2 Estimation strategy

This study utilizes quantitative methods to assess the relationship between food security and subjective well-being (SWB). Specifically, we perform an econometric analysis to explore how various dimensions of food security relate to different aspects of subjective well-being, including SWB related to food, health, income, and general life satisfaction. The econometric model we use is as follows:

$$SWB_{it} = \alpha + \beta FS_{it} + X_{it}\delta + \lambda_t + u_i + \varepsilon_{it} \qquad (1)$$

Where $\mathrm{SWB_{it}}$ represents the subjective well-being indicators for household i at time t, such as SWB regarding food, health, income, and overall life satisfaction.

$\mathrm{FS_{it}}$ captures various food security indicators, including experiences of worry about food, inability to access healthy foods, limited food variety, skipped meals, and running out of food in the past 30 days, as well as the food insecurity index.

$\mathrm{X_{it}}$ is a vector of control variables.

λ_t accounts for time-fixed effects and $\mathrm{u_i}$ represents time-invariant unobserved heterogeneity.

ε_{it} is the idiosyncratic error term.

We further examine the impact of societal factors on food insecurity using the following model:

$$FIS_{it} = \alpha + \beta SA_{it} + X_{it}\delta + \lambda_t + u_i + \varepsilon_{it} \qquad (2)$$

Where $\mathrm{FIS_{it}}$ denotes the food insecurity index.

SA_{it} captures societal aspects such as the availability of various foods in the community, and food prices.

Additionally, we explore whether societal aspects influence SWB directly by estimating:

$$SWB_{it} = \alpha + \beta SA_{it} + X_{it}\delta + \lambda_t + u_i + \varepsilon_{it} \qquad (3)$$

To estimate the above equations, we utilize panel data models. We consider three econometric models to address potential unobserved heterogeneity—individual-specific, time-invariant characteristics that may influence the outcomes but are not directly observable:

The Fixed Effects (FE) model controls for individual-specific effects that are correlated with observed covariates by demeaning the data (subtracting individual means). This transformation eliminates time-invariant characteristics but also removes any explanatory variables that do not vary over time. While the FE model is robust for analyzing time-varying variables, it cannot estimate the effects of time-invariant explanatory variables and may suffer from the incidental parameters problem in non-linear models.

The Random Effects (RE) model assumes that unobserved heterogeneity is uncorrelated with the observed covariates. By using Generalized Least Squares (GLS), it accounts for serial correlation in the error term and is often more efficient than the FE model when the assumption holds. However, this assumption is often violated in practice, potentially leading to inconsistent estimates.

The Correlated Random Effects (CRE) model addresses the limitations of the RE model by incorporating time-averages of time-varying covariates into the model, thus mitigating the correlation between unobserved heterogeneity and observed covariates. The CRE model is particularly suitable for cases with low within-individual variation and handles the incidental parameters problem in non-linear models. The model is specified as:

$$O_{it} = \alpha + X_{it}\delta + Z_i\beta + \bar{X}_i\theta + \lambda_t + u_i + \varepsilon_{it}$$

Where O_{it} denotes the outcome variable of interest; X_{it} are time-varying covariates; Z_i are time-invariant covariates; $\bar{X}_i$ denotes a vector of the time averages of the time-varying covariates for household i; λ_t is time-fixed effects, u_i represents time invariant unobserved heterogeneity, and ε_{it} is the idiosyncratic error term; i denotes households which is the cross-section dimension, and t denotes time-period.

In this paper, we focus on estimating the CRE model as our primary approach, given that most of the models are nonlinear and involve a large number of categorical variables of interest. Additionally, we report the FE estimates as a robustness check.

While the FE, RE, and CRE models help mitigate time-invariant unobserved heterogeneity, we acknowledge that endogeneity may still arise due to time-varying omitted variables. Factors such as nutritional knowledge, health status, and cultural preferences may influence both food security and subjective well-being, introducing potential endogeneity issues. Since we lack suitable instruments to address these omitted variables, our analysis should be interpreted as identifying correlations rather than establishing causal relationships.

4 Results and Discussion

This study examines the relationship between various aspects of food security and subjective well-being (SWB) using correlated random effects (CRE) probit estimations. The analysis focuses on how food security influences general welfare, food-related well-being, health-related well-being, and income-related well-being, controlling for demographic and household characteristics. The findings shed light on the multidimensional impact of food security on well-being.

The results from Table 2 show that food security significantly impacts general welfare, as measured by subjective well-being (SWB). All food security indicators, including being worried about food, inability to eat healthy, eating fewer food varieties, and running out of food, have significant negative effects on general welfare. For instance, individuals who report food insecurity exhibit a decrease in general well-being, with marginal effects ranging from -0.210 to -0.0512. These findings suggest that food insecurity detracts from an individual's overall life satisfaction, underlining the

importance of food access for emotional and psychological well-being. These results also suggest that the experiences of not being able to access enough food, or eating a limited variety, contribute strongly to reduced general welfare.

Table 2. The marginal effect of food security aspects on general welfare using CRE probit model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food insecurity Status	-0.210***	-0.194***	-0.196***	-0.202***	-0.203***	-0.199***	-0.205***	-0.143***	-0.0512***
	(0.0130)	(0.0137)	(0.0129)	(0.0121)	(0.0118)	(0.0128)	(0.0120)	(0.0160)	(0.00249)
Age	0.00178	0.00165	0.00167	0.00212	0.00228	0.000708	0.000885	0.000428	0.00172
	(0.00595)	(0.00602)	(0.00595)	(0.00584)	(0.00577)	(0.00585)	(0.00566)	(0.00593)	(0.00588)
1.sex	0.0149	0.0138	0.0159	0.0104	0.0108	0.0182	0.0217	0.0334*	0.00157
	(0.0161)	(0.0164)	(0.0162)	(0.0160)	(0.0159)	(0.0164)	(0.0163)	(0.0176)	(0.0152)
Hhsize	0.00406	0.00214	0.00430	0.0112	0.00695	0.00263	0.00972	0.00980	0.00956
	(0.0120)	(0.0119)	(0.0119)	(0.0119)	(0.0119)	(0.0120)	(0.0119)	(0.0120)	(0.0117)
1.rural	0.00138	0.00957	0.00330	0.00548	0.0147	0.0139	0.0156	0.0124	0.0113
	(0.0138)	(0.0142)	(0.0139)	(0.0139)	(0.0139)	(0.0141)	(0.0140)	(0.0148)	(0.0135)
m_age	-0.00322	-0.00344	-0.00339	-0.00382	-0.00395	-0.00230	-0.00251	-0.00221	-0.00316
	(0.00597)	(0.00604)	(0.00597)	(0.00586)	(0.00579)	(0.00587)	(0.00568)	(0.00596)	(0.00590)
m_hhsize	-0.00370	-0.00254	-0.00447	-0.0107	-0.00734	-0.00451	-0.0107	-0.0119	-0.00897
	(0.0122)	(0.0121)	(0.0121)	(0.0121)	(0.0121)	(0.0122)	(0.0121)	(0.0122)	(0.0119)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3. The marginal effect of food security aspects on negative subjective well-being on food security using CRE probit model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food insecurity status	0.436***	0.439***	0.441***	0.443***	0.445***	0.404***	0.443***	0.395***	0.107***
	(0.00776)	(0.00885)	(0.00705)	(0.00643)	(0.00694)	(0.0170)	(0.0133)	(0.0226)	(0.00131)
age	0.0126	0.0129	0.0123	0.0101	0.00969	0.0164**	0.0149*	0.0158*	0.0125*
	(0.00815)	(0.00829)	(0.00802)	(0.00766)	(0.00766)	(0.00830)	(0.00823)	(0.00867)	(0.00763)
1.sex	-0.105***	-0.0929***	-0.0983***	-0.0884***	-0.0922***	-0.126***	-0.130***	-0.147***	-0.0766***
	(0.0191)	(0.0192)	(0.0189)	(0.0189)	(0.0190)	(0.0221)	(0.0212)	(0.0226)	(0.0179)
hhsize	0.0211	0.0216	0.0181	0.00128	0.0131	0.0167	0.0127	0.00641	0.00775
	(0.0149)	(0.0148)	(0.0145)	(0.0145)	(0.0148)	(0.0152)	(0.0147)	(0.0151)	(0.0139)
1.rural	0.0564***	0.0363**	0.0503***	0.0443***	0.0218	0.0312*	0.0251	0.0324*	0.0359**
	(0.0161)	(0.0165)	(0.0160)	(0.0157)	(0.0159)	(0.0186)	(0.0178)	(0.0193)	(0.0149)
m_age	-0.0131	-0.0126	-0.0122	-0.00981	-0.00942	-0.0160*	-0.0144*	-0.0151*	-0.0128*
	(0.00818)	(0.00831)	(0.00804)	(0.00768)	(0.00769)	(0.00833)	(0.00826)	(0.00871)	(0.00765)
m_hhsize	-0.0154	-0.0149	-0.0122	0.00388	-0.00588	-0.00544	-0.00279	0.00555	-0.00281
	(0.0151)	(0.0150)	(0.0147)	(0.0147)	(0.0150)	(0.0155)	(0.0150)	(0.0154)	(0.0141)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4. The marginal effect of food security aspects on negative subjective well-being on health using CRE probit model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food insecurity status	0.254***	0.275***	0.280***	0.270***	0.275***	0.214***	0.259***	0.273***	0.0649***
	(0.0139)	(0.0142)	(0.0132)	(0.0129)	(0.0128)	(0.0165)	(0.0146)	(0.0189)	(0.00274)
age	0.00682	0.00673	0.00642	0.00547	0.00504	0.00867	0.00771	0.00878	0.00667
	(0.00756)	(0.00762)	(0.00746)	(0.00738)	(0.00734)	(0.00755)	(0.00733)	(0.00783)	(0.00749)
1.sex	-0.00469	0.00278	1.61e-05	0.00501	0.00587	-0.0131	-0.0132	-0.0196	0.0110
	(0.0197)	(0.0194)	(0.0193)	(0.0194)	(0.0193)	(0.0207)	(0.0201)	(0.0205)	(0.0188)
hhsize	-0.0235	-0.0230	-0.0252*	-0.0339**	-0.0269*	-0.0272*	-0.0305**	-0.0310**	-0.0319**
	(0.0144)	(0.0143)	(0.0142)	(0.0142)	(0.0143)	(0.0142)	(0.0143)	(0.0143)	(0.0142)
1.rural	0.0402**	0.0310*	0.0392**	0.0338**	0.0216	0.0270	0.0223	0.0251	0.0280*
	(0.0169)	(0.0168)	(0.0167)	(0.0168)	(0.0168)	(0.0177)	(0.0172)	(0.0175)	(0.0164)
m_age	-0.00646	-0.00597	-0.00578	-0.00477	-0.00438	-0.00786	-0.00692	-0.00799	-0.00626
	(0.00760)	(0.00765)	(0.00749)	(0.00741)	(0.00737)	(0.00759)	(0.00737)	(0.00787)	(0.00752)
m_hhsize	0.0250*	0.0247*	0.0268*	0.0352**	0.0293**	0.0317**	0.0339**	0.0356**	0.0331**
	(0.0146)	(0.0145)	(0.0144)	(0.0145)	(0.0146)	(0.0145)	(0.0145)	(0.0146)	(0.0144)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. The marginal effect of food security aspects on subjective well-being on income using CRE probit model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food insecurity status	-0.150***	-0.127***	-0.146***	-0.143***	-0.138***	-0.130***	-0.172***	-0.127***	-0.0405***
	(0.0131)	(0.0110)	(0.0129)	(0.0141)	(0.0146)	(0.0202)	(0.0244)	(0.0238)	(0.00362)
age	-0.00312	-0.00303	-0.00319	-0.00328	-0.00348	-0.00474	-0.00507	-0.00481	-0.00314
	(0.00441)	(0.00431)	(0.00443)	(0.00459)	(0.00473)	(0.00494)	(0.00473)	(0.00457)	(0.00449)
1.sex	-0.000879	-0.00310	-0.00297	-0.00236	-0.000745	0.00563	0.00693	0.0105	-0.00674
	(0.0119)	(0.0119)	(0.0119)	(0.0121)	(0.0121)	(0.0120)	(0.0118)	(0.0118)	(0.0123)
hhsize	0.0144	0.0138	0.0155	0.0192**	0.0175*	0.0158*	0.0152	0.0171*	0.0193**
	(0.00948)	(0.00956)	(0.00968)	(0.00957)	(0.00959)	(0.00935)	(0.00936)	(0.00924)	(0.00952)
1.rural	-0.00881	-0.00144	-0.00641	-0.00538	-0.000919	-0.00320	-0.00128	-0.00301	-0.00348
	(0.0102)	(0.00992)	(0.0100)	(0.0102)	(0.0102)	(0.0105)	(0.0104)	(0.0107)	(0.0100)
m_age	0.00328	0.00307	0.00319	0.00320	0.00337	0.00460	0.00491	0.00461	0.00317
	(0.00441)	(0.00432)	(0.00443)	(0.00460)	(0.00473)	(0.00495)	(0.00474)	(0.00458)	(0.00450)
m_hhsize	-0.0147	-0.0147	-0.0159	-0.0198**	-0.0186*	-0.0175*	-0.0167*	-0.0190**	-0.0197**
	(0.00967)	(0.00977)	(0.00988)	(0.00977)	(0.00980)	(0.00957)	(0.00957)	(0.00946)	(0.00973)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3 examines the impact of food security on food-related subjective well-being. The results reveal that food insecurity is positively associated with higher levels of food-related dissatisfaction. All aspects of food insecurity, such as the worry about food, inability to eat healthy, and running out of food, show significant positive effects on food-related SWB, with marginal effects ranging from 0.107 to 0.443. These findings highlight that individuals who experience less food insecurity, such as not skipping meals or having access to a variety of foods, report greater satisfaction with their food-related well-being. In particular, experiencing hunger or food shortages appears to be particularly important for increasing one's dissatisfaction with food. The results indicate that food security is a key determinant of how individuals perceive their food-related well-being.

In Table 4, we observe that food insecurity is positively associated with dissatisfaction in health-related subjective well-being. All food security aspects, including worry about food and experiencing limitations such as running out of food or skipping meals, show significant positive effects on health-related SWB dissatisfaction, with marginal effects ranging from 0.214 to 0.273. These results suggest that greater food security contributes to better self-reported health and overall physical well-being. The effects are particularly strong for individuals who experience hunger or who have consistent access to healthy food options. This supports the hypothesis that food security plays a crucial role in maintaining not just food-related but also health-related well-being. In essence, ensuring food security appears to improve both physical health and perceptions of well-being related to health.

Table 5 reveals a negative association between food security and income-related subjective well-being. All food security aspects, such as running out of food, skipping meals, or being unable to eat a healthy diet, show significant negative effects on income-related SWB, with marginal effects ranging from -0.172 to -0.0405. These findings suggest that food insecurity exacerbates concerns about financial stability and economic well-being. Individuals who face food insecurity are more likely to experience negative feelings about their income and economic situation, further demonstrating how food-related stress can impact broader perceptions of economic

well-being. The results point to the fact that food insecurity is not only a physical or psychological challenge but also an economic one, reducing one's satisfaction with income and economic security.

The key findings from this analysis highlight the pervasive influence of food security on various dimensions of subjective well-being (SWB). First, food security consistently shows significant effects across all aspects of SWB. Specifically, food insecurity has a negative impact on general welfare, with worrying about food and other forms of food scarcity leading to a marked reduction in general life satisfaction. On the other hand, food security has a positive impact on food-related well-being, with improved food access and fewer food-related worries associated with higher levels of happiness and satisfaction regarding food. Similarly, food security positively influences health-related SWB, as better access to food or reduced food insecurity contributes to improved self-reported health and overall well-being. However, food insecurity shows a negative impact on income-related SWB, suggesting that food insecurity exacerbates concerns about income security, possibly reflecting broader economic vulnerabilities.

Additionally, age and sex emerge as important factors that mediate the relationship between food security and subjective well-being. Despite these mediating variables, food security remains a central determinant of well-being across all dimensions. These results provide strong evidence that addressing food insecurity can lead to significant improvements in both physical and mental well-being, highlighting the need for policy interventions aimed at enhancing food security to improve overall life satisfaction and health outcomes.

For robustness, we also replicated the estimations presented in Tables 2-5 using a fixed effects (FE) model. The results, which are available in Sub-appendix B4 Tables B1-B4, exhibit patterns consistent with those obtained using the correlated random effects (CRE) model.

Next, we examine the societal factors influencing food insecurity, which may help explain its impact on well-being. The results, presented in Tables 6 and 7, explore how food availability and prices contribute to variations in food insecurity.

Table 6. The marginal effect of availability of main foods on food insecurity using CRE model

Variables	(1) Maize flour available	(2) Rice available	(3) Beans available	(4) Beef available
Availability of main foods	-0.546***	-0.707**	-0.550**	0.772***
	(0.113)	(0.336)	(0.255)	(0.128)
age	0.0353	0.0400	0.0400	0.0398
	(0.0299)	(0.0298)	(0.0298)	(0.0298)
1.sex	-0.642***	-0.648***	-0.652***	-0.643***
	(0.111)	(0.112)	(0.112)	(0.111)
hhsize	-0.00997	-0.0191	-0.0202	-0.00990
	(0.0640)	(0.0638)	(0.0638)	(0.0638)
1.rural	0.155	0.0962	0.100	0.0193
	(0.0971)	(0.0972)	(0.0972)	(0.0971)
m_age	-0.0238	-0.0289	-0.0290	-0.0291
	(0.0301)	(0.0300)	(0.0300)	(0.0300)
m_hhsize	0.0669	0.0748	0.0762	0.0600
	(0.0658)	(0.0656)	(0.0656)	(0.0657)
Observations	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6 examines the relationship between the availability of essential foods (maize flour, rice, beans, and beef) and food insecurity (FIS). The results indicate that the availability of maize flour, rice, and beans significantly reduces food insecurity, as indicated by the negative marginal effects. Specifically, the availability of maize flour decreases food insecurity by 0.546, rice by 0.707, and beans by 0.550, with all these effects statistically significant at the 1% or 5% level. In contrast, the availability of beef has a positive and statistically significant effect, increasing food insecurity by 0.772, highlighting an intriguing counterintuitive relationship where greater beef availability may be linked to higher levels of food insecurity.

This suggests that, for the staple foods (maize flour, rice, and beans), their availability in the community plays an important role in reducing food insecurity. However, the effect for beef suggests that availability may not always lead to positive outcomes for food security, potentially due to factors such as affordability or cultural preferences that limit its consumption.

The control variables also provide some noteworthy insights. Sex is a significant predictor of food insecurity, with females being more likely to experience food insecurity, as indicated by the negative and highly significant coefficients across all models. The age of the household head does not have a significant effect on food insecurity, nor does the household size or rural vs. urban location, suggesting that societal food availability may be a more important determinant of food insecurity than these demographic factors.

The results highlight the critical role that food availability plays in influencing food insecurity, especially for staple foods. However, the positive effect for beef availability reinforces the complexity of the relationship between food availability and insecurity, suggesting that additional factors such as food preferences and economic access may need to be considered in future studies.

Table 7. The marginal effect of price of main foods on food insecurity using CRE model

Variables	(1) Price maize flour	(2) Price rice	(3) Price beans	(4) Price beef
Price of main foods	0.517***	0.755***	0.848***	-0.0506
	(0.186)	(0.206)	(0.172)	(0.220)
age	0.0668*	0.0708*	0.0454	0.0419
	(0.0386)	(0.0389)	(0.0356)	(0.0293)
1.sex	-0.552***	-0.648***	-0.604***	-0.787***
	(0.128)	(0.113)	(0.117)	(0.119)
hhsize	-0.0485	-0.0429	-0.0645	-0.0896
	(0.0806)	(0.0683)	(0.0703)	(0.0698)
1.rural	0.154	0.120	0.0998	0.0268
	(0.112)	(0.0986)	(0.103)	(0.102)
m_age	-0.0519	-0.0602	-0.0331	-0.0298
	(0.0388)	(0.0391)	(0.0358)	(0.0296)
m_hhsize	0.103	0.106	0.120*	0.142**
	(0.0832)	(0.0700)	(0.0722)	(0.0717)
Observations	2,383	3,236	2,943	2,771

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7 explores the relationship between the prices of essential foods (maize flour, rice, beans, and beef) and food insecurity. The findings show that higher prices for

maize flour, rice, and beans significantly increase food insecurity, with price elasticity estimates of 0.517 for maize flour, 0.755 for rice, and 0.848 for beans, all statistically significant at the 1% level. These results suggest that increases in the prices of these staple foods directly contribute to higher food insecurity, likely because higher food prices reduce the affordability and accessibility of these essential items for households.

Interestingly, the price of beef does not show a significant effect on food insecurity, with a marginal effect of -0.0506, which is not statistically significant. This could suggest that beef may not play as significant a role in food insecurity for most households compared to other staple foods, potentially due to cultural or dietary preferences, or because beef is a less common staple food in certain areas.

In terms of control variables, age has a small but statistically significant positive effect on food insecurity, indicating that older individuals may be more vulnerable to food insecurity. Sex remains a significant predictor, with females again more likely to experience food insecurity, as shown by the negative coefficients for all food prices. Household size is not significantly related to food insecurity for most food types, except for a marginal effect for rice, indicating that the number of individuals in the household does not strongly influence food insecurity when food prices are taken into account. The rural variable has a positive but non-significant effect for most food types, suggesting that rural areas are not necessarily more vulnerable to food insecurity relative to urban areas when controlling for food prices.

The findings emphasize the strong link between rising food prices and increased food insecurity, particularly for staple foods like maize flour, rice, and beans. While the effect for beef is less pronounced, the general trend illustrates the importance of food affordability in addressing food insecurity. These results suggest that policies aimed at controlling food prices could be an effective tool in alleviating food insecurity, particularly for vulnerable populations.

Finally, we explore the impact of food availability and prices on general subjective well-being (SWB). Results from Tables 8 and 9 highlight how access to essential foods and their prices influence overall life satisfaction.

Table 8. The marginal effect of availability of main foods on general SWB using CRE probit model

Variables	(1) Maize flour available	(2) Rice available	(3) Beans available	(4) Beef available
Availability of main foods	0.0436**	0.0778	0.0704*	0.0630***
	(0.0185)	(0.0479)	(0.0371)	(0.0186)
age	-0.000195	-0.000529	-0.000533	-0.000525
	(0.00582)	(0.00576)	(0.00576)	(0.00574)
1.sex	0.0406**	0.0410**	0.0416**	0.0416**
	(0.0182)	(0.0182)	(0.0182)	(0.0182)
hhsize	0.00904	0.00974	0.00986	0.0101
	(0.0119)	(0.0119)	(0.0119)	(0.0120)
1.rural	0.00380	0.00869	0.00803	0.00248
	(0.0151)	(0.0151)	(0.0151)	(0.0151)
m_age	-0.00187	-0.00152	-0.00150	-0.00152
	(0.00585)	(0.00579)	(0.00579)	(0.00577)
m_hhsize	-0.0115	-0.0122	-0.0123	-0.0129
	(0.0121)	(0.0121)	(0.0121)	(0.0122)
Observations	3,440	3,440	3,440	3,440

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the marginal effects of the availability of key food staples on general subjective well-being (SWB). The results show that the availability of foods like maize flour, beans, and beef positively influences general SWB, though the impact varies across different food types. The availability of maize flour has a statistically significant positive effect on general SWB (coefficient = 0.0436, p<0.05), suggesting that greater access to this staple food contributes to higher life satisfaction. Similarly, beans availability also has a positive, albeit smaller, effect (coefficient = 0.0704, p<0.1), indicating that beans play an important role in enhancing well-being, although the effect is not as strong as that of maize flour. On the other hand, rice availability does not show a statistically significant relationship with general SWB (coefficient = 0.0778), which may suggest that rice, while an essential food, does not have as direct an impact on overall well-being in this sample. Interestingly, beef availability has the most significant positive impact on general SWB (coefficient = 0.0630, p<0.01), highlighting its importance in contributing to life satisfaction, possibly due to its nutritional value

and cultural significance in many households. Other control variables such as age, household size, and rural location do not show significant effects on SWB, while sex remains significant, with females reporting slightly higher levels of general SWB compared to males. These results suggest that improving the availability of key food staples like maize flour and beef can have a substantial positive impact on general well-being, reinforcing the importance of food security policies that focus on increasing access to these foods.

Table 9. The marginal effect of price of main foods on general SWB using CRE probit model

Variables	(1) Price maize flour	(2) Price rice	(3) Price beans	(4) Price beef
Price of main foods	0.0448	-0.131***	0.00191	0.0601
	(0.0317)	(0.0346)	(0.0298)	(0.0386)
age	-0.00106	-0.000562	0.000948	-0.000591
	(0.00740)	(0.00705)	(0.00660)	(0.00577)
1.sex	0.0397*	0.0398**	0.0366*	0.0458**
	(0.0213)	(0.0185)	(0.0194)	(0.0204)
hhsize	0.00920	0.0159	0.0165	0.0153
	(0.0149)	(0.0128)	(0.0132)	(0.0132)
1.rural	0.00696	0.00122	0.00735	-0.00168
	(0.0179)	(0.0153)	(0.0164)	(0.0165)
m_age	-0.00115	-0.00122	-0.00294	-0.00172
	(0.00743)	(0.00707)	(0.00663)	(0.00580)
m_hhsize	-0.0106	-0.0179	-0.0187	-0.0182
	(0.0152)	(0.0130)	(0.0135)	(0.0134)
Observations	2,383	3,236	2,943	2,771

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 9 examines the relationship between food prices and general subjective well-being (SWB). The results indicate that food prices, particularly the price of rice, are negatively associated with general SWB, with significant variation across different food items. The price of maize flour shows a positive but statistically insignificant effect on general SWB (coefficient = 0.0448), suggesting that price changes in maize flour may not have a substantial or consistent impact on overall well-being. In contrast, the price of rice has a significant negative impact on general SWB (coefficient = -0.131, p<0.01),

indicating that as the price of rice increases, individuals report lower levels of life satisfaction. This could be due to rice being a staple food in many households, where rising prices may contribute to food insecurity and financial stress, thereby diminishing well-being. The price of beans has a minimal and statistically insignificant effect (coefficient = 0.00191), suggesting that price changes in beans do not significantly affect general well-being. Similarly, the price of beef also does not show a significant effect on SWB (coefficient = 0.0601), which may reflect the fact that beef is considered a luxury item for some households, and price changes may not impact general life satisfaction in the same way that essential foods like rice do. As in Table 25, sex is a significant variable, with females reporting higher general SWB than males, and household size and rural location again have little impact on the relationship between food prices and well-being. These findings suggest that rising food prices, particularly for essential foods like rice, have a significant negative impact on general SWB. The results highlight the need for policies aimed at reducing the financial burden of essential food items, particularly in areas where food price increases may exacerbate food insecurity and reduce overall well-being.

Both Table 8 and Table 9 demonstrate the critical role of food availability and affordability in shaping general subjective well-being. The availability of key food staples like maize flour and beef significantly enhances well-being, while rising food prices, especially for rice, contribute to a decline in life satisfaction. These findings highlight the importance of improving food security through increased availability of essential foods and mitigating the impact of rising food prices on vulnerable populations. Policies focused on reducing food insecurity, ensuring the affordability of staples, and promoting access to nutritious foods can play a vital role in improving both physical and mental well-being.

5 Conclusions

This study explores the relationship between food security and subjective well-being (SWB) in Tanzania, highlighting the significant role that food security plays in shaping various dimensions of well-being, including general life satisfaction, food-related satisfaction, health, and income-related well-being. Drawing on data from the Tanzania

High Frequency Welfare Monitoring Phone Survey (HFWMPS), the paper examines how food insecurity—manifested through concerns such as worries about food, inability to eat a healthy diet, and limited food variety—affects overall well-being. The study employs a robust econometric analysis using the Correlated Random Effects (CRE) model, ensuring the reliable estimation of causal relationships while controlling for household characteristics and potential confounding factors.

The results reveal a consistent pattern across all aspects of SWB. Food insecurity is negatively associated with general well-being, with experiences of food scarcity or concerns about food availability leading to significant reductions in life satisfaction. Conversely, greater food security is positively linked to enhanced food-related, health-related, and even income-related SWB. This underscores the multifaceted nature of food security's impact on mental and physical health, as well as its economic implications. Individuals with better access to food report higher happiness regarding their food and health, while those facing food insecurity often experience negative feelings about their income and financial security.

The analysis also identifies key societal factors influencing food insecurity. Specifically, food availability—particularly staples like maize flour, rice, and beans—was found to significantly reduce food insecurity, while rising food prices were linked to greater food insecurity and a decrease in SWB. These findings emphasize the importance of both food access and affordability in shaping well-being, highlighting the need for targeted policy interventions.

Policy recommendations based on these findings include increasing the availability of essential foods in communities, controlling food prices, and addressing socio-economic disparities that exacerbate food insecurity. Efforts to ensure affordable, nutritious food access, particularly in vulnerable populations, can lead to substantial improvements in both physical health and mental well-being. Furthermore, future research should explore the broader economic and social factors influencing food security to inform more comprehensive and context-specific policies aimed at improving the welfare of disadvantaged groups.

In sum, this study contributes valuable insights into the interconnectedness of food security and subjective well-being, offering empirical evidence to support the implementation of policies that enhance food security as a means of improving overall human welfare in developing countries like Tanzania.

References

Alem, Y., & Köhlin, G. (2014). Food price inflation and subjective well-being: Panel data evidence from urban Ethiopia. *Social Indicators Research, 116*(3), 853–868.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological bulletin*, *125*(2), 276.

Food and Agriculture Organization (FAO). (1996). Rome Declaration on World Food Security and World Food Summit Plan of Action. Retrieved from https://www.fao.org/4/w3613e/w3613e00.htm

Frey, B. S., & Stutzer, A. (2021). Does Sports Make People Happier?, *Journal of Sports Economics, 22(4),* 432-458

Frongillo, E. A., Nguyen, H. T., Smith, M. D., & Coleman-Jensen, A. (2019). Food insecurity is more strongly associated with poor subjective well-being in more-developed countries than in less-developed countries. *The Journal of nutrition*, *149*(2), 330-335.

Frongillo, E. A., Nguyen, H. T., Smith, M. D., & Johnson, A. C. (2017). Food insecurity and subjective well-being: Evidence from the United States and developing countries. *The Journal of Nutrition, 147*(5), 681–688.

Kornher, L., & Sakketa, T. G. (2021). Does food security matter to subjective well-being? Evidence from a cross-country panel. *Journal of International Development*, *33*(8), 1270-1289.

Litsardopoulos, N., Saridakis, G., Georgellis, Y., & Hand, C. (2022). Self-employment experience effects on well-being: A longitudinal study. *Economic and Industrial Democracy*, 1–27.

Mekonnen, D. A., & Gerber, N. (2020). Do aspirations matter for food security and subjective well-being? Panel data evidence from rural Ethiopia. *Food Security, 12*(1), 215–230.

Stutzer, A. (2008). The economics of subjective well-being. IZA Discussion Paper No. 3639.

Sulemana, I., & Sulemana-James, F. K. A. (2020). Food insecurity and subjective well-being in Africa. International Journal of Happiness and Development, 7(4), 2291–2311.

Sub-appendix B4

Table B1. The marginal effect of food security aspects on general welfare using FE model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food security status	-0.126***	-0.110***	-0.0986***	-0.131***	-0.139***	-0.139***	-0.170***	-0.113***	-0.0408***
	(0.0196)	(0.0199)	(0.0188)	(0.0191)	(0.0194)	(0.0223)	(0.0227)	(0.0274)	(0.00461)
age	0.000584	0.000417	0.000225	0.000749	0.000816	-0.000147	1.65e-05	-0.000290	0.000822
	(0.00579)	(0.00581)	(0.00581)	(0.00578)	(0.00577)	(0.00579)	(0.00576)	(0.00583)	(0.00573)
1.sex	0.167	0.171	0.193	0.214	0.246	0.168	0.228	0.193	0.183
	(0.203)	(0.203)	(0.203)	(0.202)	(0.202)	(0.203)	(0.202)	(0.204)	(0.200)
hhsize	0.00633	0.00680	0.00790	0.0112	0.00823	0.00669	0.00775	0.00974	0.00992
	(0.0123)	(0.0124)	(0.0124)	(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0124)	(0.0122)
Constant	0.700**	0.700**	0.675**	0.619*	0.607*	0.700**	0.653**	0.656**	0.589*
	(0.320)	(0.321)	(0.322)	(0.320)	(0.319)	(0.321)	(0.319)	(0.322)	(0.317)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440
R-squared	0.025	0.019	0.017	0.028	0.030	0.023	0.033	0.011	0.045
Number of id	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table B2. The marginal effect of food security aspects on negative subjective well-being on food using FE model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food security status	0.358***	0.341***	0.382***	0.409***	0.400***	0.294***	0.375***	0.266***	0.341***
	(0.0228)	(0.0233)	(0.0214)	(0.0217)	(0.0222)	(0.0268)	(0.0268)	-0.0332	(0.0233)
Age	0.0117*	0.0119*	0.0117*	0.0109*	0.0110*	0.0143**	0.0138**	0.0144**	0.0114*
	(0.00673)	(0.00679)	(0.00661)	(0.00655)	(0.00660)	(0.00696)	(0.00682)	(0.00707)	(0.00645)
1.sex	0.00803	0.00415	-0.0624	-0.130	-0.216	-0.0126	-0.143	-0.0674	-0.0400
	(0.236)	(0.238)	(0.231)	(0.229)	(0.231)	(0.244)	(0.239)	(0.247)	(0.226)
Hhsize	0.0149	0.0146	0.0134	0.000958	0.00964	0.0110	0.00903	0.00476	0.00455
	(0.0143)	(0.0145)	(0.0141)	(0.0139)	(0.0140)	(0.0148)	(0.0145)	(0.0150)	(0.0137)
Constant	-0.457	-0.470	-0.404	-0.217	-0.192	-0.426	-0.327	-0.333	-0.160
	(0.373)	(0.376)	(0.366)	(0.363)	(0.365)	(0.385)	(0.377)	(0.391)	(0.357)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440
R-squared	0.128	0.114	0.159	0.174	0.162	0.069	0.105	0.039	0.199
Number of id	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table B3. The marginal effect of food security aspects on negative subjective well-being on health using FEE model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food security status	0.159***	0.167***	0.196***	0.210***	0.205***	0.187***	0.226***	0.203***	0.0514***
	(0.0229)	(0.0232)	(0.0217)	(0.0221)	(0.0225)	(0.0260)	(0.0264)	(0.0318)	(0.00537)
age	0.00529	0.00520	0.00503	0.00457	0.00467	0.00616	0.00595	0.00614	0.00499
	(0.00676)	(0.00675)	(0.00670)	(0.00668)	(0.00669)	(0.00675)	(0.00671)	(0.00677)	(0.00668)
1.sex	0.432*	0.434*	0.402*	0.367	0.323	0.434*	0.354	0.400*	0.412*
	(0.237)	(0.236)	(0.234)	(0.234)	(0.234)	(0.236)	(0.235)	(0.237)	(0.234)
hhsize	-0.0300**	-0.0296**	-0.0299**	-0.0363**	-0.0319**	-0.0301**	-0.0316**	-0.0338**	-0.0345**
	(0.0144)	(0.0144)	(0.0142)	(0.0142)	(0.0142)	(0.0144)	(0.0143)	(0.0144)	(0.0142)
Constant	-0.216	-0.228	-0.198	-0.101	-0.0890	-0.220	-0.157	-0.160	-0.0775
	(0.374)	(0.374)	(0.371)	(0.370)	(0.370)	(0.374)	(0.371)	(0.375)	(0.370)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440
R-squared	0.033	0.035	0.051	0.055	0.051	0.035	0.046	0.029	0.056
Number of id	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table B4. The marginal effect of food security aspects on subjective well-being on income using FE model

Variables	(1) Worried about food	(2) Unable to eat healthy	(3) Ate few kinds of food	(4) Skipped meal	(5) Ate less food	(6) Ran out of food	(7) Hungry but didn't eat	(8) Didn't eat whole-day	(9) Food insecurity index
Food security status	-0.0910***	-0.0623***	-0.0718***	-0.0707***	-0.0634***	-0.0495***	-0.0689***	-0.0686***	-0.0201***
	(0.0138)	(0.0141)	(0.0133)	(0.0136)	(0.0138)	(0.0159)	(0.0162)	(0.0193)	(0.00329)
age	-0.00450	-0.00480	-0.00475	-0.00465	-0.00475	-0.00525	-0.00515	-0.00518	-0.00469
	(0.00408)	(0.00411)	(0.00410)	(0.00410)	(0.00411)	(0.00412)	(0.00411)	(0.00412)	(0.00409)
1.sex	0.193	0.199	0.211	0.223	0.236	0.203	0.226	0.212	0.207
	(0.143)	(0.144)	(0.143)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.143)
hhsize	0.0109	0.0119	0.0121	0.0144*	0.0130	0.0127	0.0129	0.0135	0.0137
	(0.00869)	(0.00876)	(0.00872)	(0.00872)	(0.00874)	(0.00878)	(0.00875)	(0.00876)	(0.00870)
Constant	0.139	0.132	0.121	0.0873	0.0852	0.123	0.106	0.107	0.0748
	(0.226)	(0.228)	(0.227)	(0.227)	(0.228)	(0.228)	(0.228)	(0.228)	(0.226)
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440
R-squared	0.028	0.015	0.020	0.019	0.016	0.009	0.014	0.011	0.025
Number of id	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Ghana

How does social capital contribute to well-being in times of economic challenges

1 Introduction

1.1 EU Horizon context and task 4.5 alignment

Work Package 4 of the WISER project investigates the role of communities in shaping well-being in Sub-Saharan Africa under conditions of economic hardship. Task 4.5 specifically examines the link between **social capital, economic growth, and well-being**, recognizing that in contexts where state welfare systems are thin or absent, community structures perform vital functions of risk pooling, support, and resilience. Deliverable D4.6 requires country-level case studies that demonstrate empirically how social capital operates as an informal safety net and as a potential lever for inclusive economic growth.

This Ghana report represents the Kumasi case study, focusing on female street vendors and hawkers as a particularly vulnerable but economically significant population. The outputs provide empirical evidence for WP7, which will synthesize cross-country findings into comparative insights for Sub-Saharan Africa. While the current deliverable does not engage in direct cross-country comparison, it offers the Ghanaian evidence base required for the broader project.

1.2 Global and regional context: crisis, recovery, and social resilience

The global post-COVID landscape has been marked by multiple overlapping crises: health shocks, food insecurity, volatile energy markets, and fiscal distress. These dynamics have disproportionately affected low- and middle-income countries, including those in Sub-Saharan Africa (SSA). Recovery has been fragile. While growth is projected to rise modestly—3.4% in 2024 and 3.8% in 2025 (World Bank, 2024; IMF, 2024)—inflation, high debt service, and tight credit conditions continue to constrain fiscal space.

In this constrained environment, the importance of social foundations of well-being has intensified. Social capital—understood as networks, reciprocity, trust, and associational life—has been repeatedly shown to enhance subjective well-being and buffer households against economic shocks (Helliwell & Putnam, 2004; Narayan & Pritchett, 1999; Grootaert & van Bastelaer, 2002). In contexts where state support is limited, such as SSA, community structures operate as informal social protection, providing coping mechanisms through rotating savings groups, kinship ties, faith communities, and neighbourhood associations.

1.3 Ghana's crisis context

Ghana provides a paradigmatic case of post-pandemic economic vulnerability. Pandemic-era revenue shortfalls combined with rising global borrowing costs produced severe macroeconomic stress. By December 2022, inflation had surged to 54.1% (Ghana Statistical Service, 2023), eroding household purchasing power. In December 2022, the Government of Ghana launched the Domestic Debt Exchange Programme (DDEP), restructuring domestic bonds by lowering coupon payments and extending maturities. While essential for unlocking an IMF support package, the program imposed immediate costs: banks and pension funds registered impairment losses, liquidity tightened, and many households lost savings (IMF, 2023; Bank of Ghana, 2023).

At the household level, these dynamics translated into food price spikes, declining real incomes, and restricted access to credit. Informal workers—lacking formal safety nets—absorbed the brunt of the shock. Community-based coping mechanisms became central to survival.

1.4 Why focus on Kumasi's informal economy?

Kumasi, Ghana's second largest metropolis and the capital of the Ashanti Region, provides a critical lens on the intersection of informality, social capital, and resilience. The city is a hub for trade and transport, with women dominating the street vending and hawking sectors. Informal workers face precarious conditions: harassment,

insecure incomes, health risks, and exposure to eviction under urban redevelopment (Mitullah, 2003; WIEGO, 2020).

The multi-phase Kejetia/Central Market redevelopment, one of West Africa's largest urban market projects, displaced thousands of vendors, intensifying their dependence on social capital—susu groups, faith networks, kinship systems—for survival. Kumasi thus offers a living laboratory for understanding how community structures sustain livelihoods under conditions of systemic crisis.

1.5 The problem and knowledge gap

While substantial global literature links social capital to well-being, evidence from urban SSA contexts under fiscal retrenchment remains limited. Most studies predate the COVID-era shocks or do not capture the mechanisms through which social networks provide resilience—whether through credit smoothing, childcare support, emotional assistance, or collective bargaining. Moreover, little is known about how these mechanisms intersect with economic growth outcomes in contexts like Kumasi, where informality dominates.

The WISER project seizes this gap, positioning Kumasi as a case to analyze whether and how social networks stabilize well-being during crises and what policy lessons can be drawn.

1.6 Objectives and research questions

Overall Objective: To analyze how social capital sustains well-being and economic resilience during hardship in Ghana's urban informal economy.

Research Questions:

- RQ1: What are the structural and cognitive dimensions of social capital among Kumasi women vendors?
- RQ2: How strongly does social capital predict life satisfaction after controlling for covariates?

- RQ3: Does social capital mediate the relationship between shocks and well-being?
- RQ4: Does institutional trust or market governance moderate the SC–well-being link?
- RQ5: How does social capital contribute to economic resilience and growth potential in the urban informal sector?

1.7 Structure of the report

The report proceeds as follows:

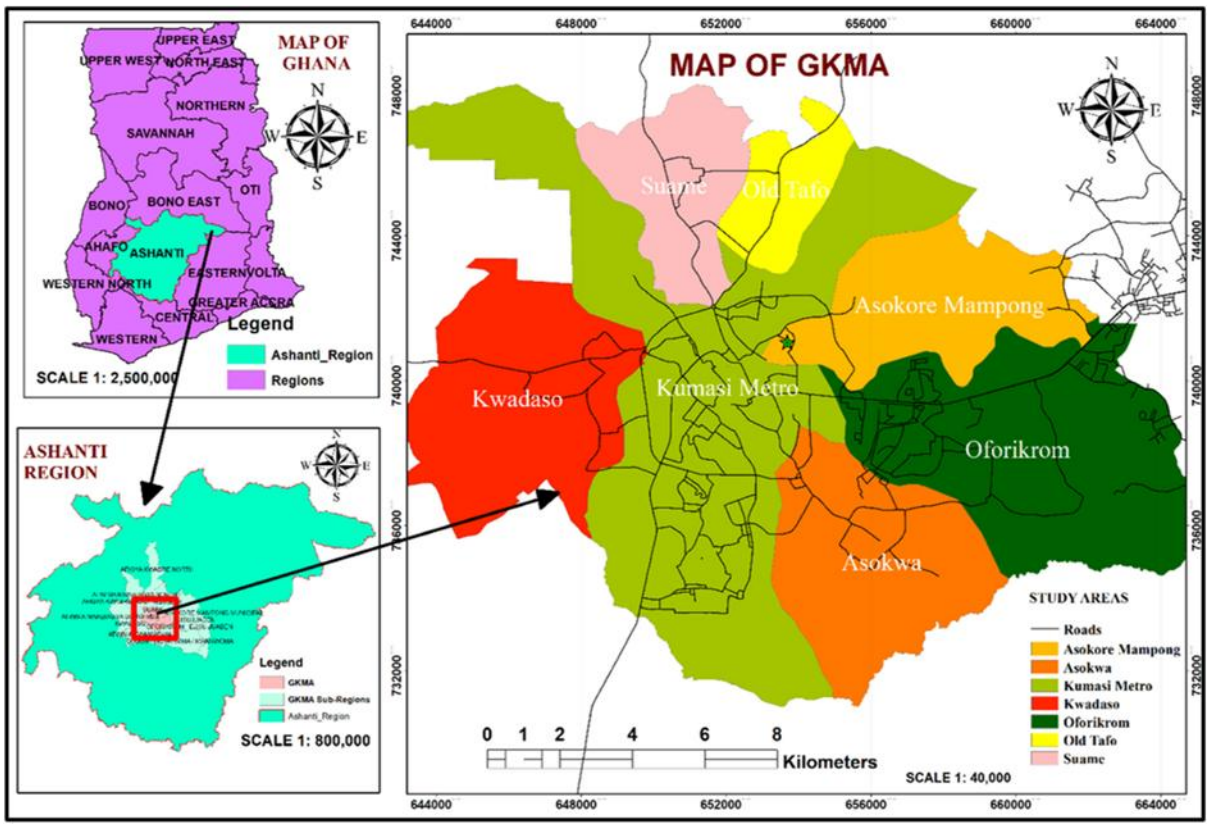
- Section 2 details the methodology and study design.
- Sections 3–6 present empirical findings on demographics, economic challenges, health, and social capital.
- Section 7 develops composite indices of vulnerability and social capital.
- Section 8 bridges social capital to economic growth.
- Section 9 outlines policy recommendations.
- Section 10 concludes with implications for WISER Deliverable D4.6 and WP7.

2 Methodology

2.1 Study area

The research was conducted in the Greater Kumasi Metropolitan Area (GKMA), Ghana's second-largest urban agglomeration and the commercial hub of the Ashanti Region. GKMA covers Kumasi and seven adjoining municipalities (Asokore Mampong, Oforikrom, Suame, Kwadaso, Tafo, Old Tafo, and Ejisu), forming a dense economic corridor where all major national road networks converge. With a population of nearly 2.9 million in 2021 (projected to exceed 4 million by 2025), Kumasi epitomises rapid urban growth, informal settlement expansion, and a dominant reliance on informal trading. An estimated 35–40% of residents live in informal settlements, with women comprising the majority of informal retail traders and hawkers.

Figure 1. Study Area-Greater Kumasi Metropolitan Area



This context made Kumasi an ideal site to examine the nexus between social capital, vulnerability, and well-being, given the scale of female participation in vending, their exposure to shocks (e.g., harassment, insecure spaces, weather risks), and their exclusion from formal welfare protections.

2.2 Study population and design

The study focused on **female vendors and hawkers**, defined as women aged 18+ engaged in vending for at least six months, operating from fixed stalls, mobile platforms, or hybrid arrangements. Women vendors were chosen because of their dual economic indispensability and heightened vulnerability: they provide essential distribution of goods but often bear childcare responsibilities, face harassment, and lack access to pensions, insurance, or bank credit.

A **quantitative, cross-sectional survey design** was employed. This allowed for systematic collection of large-scale, comparable data within a defined time frame

(January–March 2025), capturing vendor conditions at a moment of heightened economic stress.

2.3 Sampling frame and strategy

Because Ghana lacks an official vendor registry, the sampling frame was developed through:

1. **Mapping Exercise:** Observation across transport terminals, markets, and roadside vending corridors to identify clusters.
2. **Stakeholder Liaison:** Engagement with market associations, trade leaders, and local officials to validate and expand the lists.

A **multi-stage stratified sampling approach** was applied:

- **Stage 1:** All eight GKMA municipalities were purposively included for city-wide representation.
- **Stage 2:** Within each municipality, major markets and vending corridors were mapped and stratified.
- **Stage 3:** Vendors were selected through **systematic random sampling** along transects (every nth vendor), ensuring randomness while maintaining feasibility.

The sample size was determined using Cochran's formula. While 384 respondents were sufficient at 95% confidence with a 5% margin of error, the target was increased to 704 respondents to strengthen subgroup analysis and compensate for non-response. Respondent allocation followed a probability-proportional-to-size logic based on vendor density, market footfall, and node centrality, with higher quotas assigned to Kumasi Metropolitan Assembly and high-density markets.

Table 1. Sample Allocation across GKMA Municipalities

Municipality	Sample Size
Kumasi Metropolitan Assembly (KMA)	268
Oforikrom	84
Asokore Mampong	79
Kwadaso	77
Old Tafo	69
Asokwa	64

Suame	35
Other area*	28
Total	**704**

*Note: “Other area” refers to respondents trading within the GKMA but outside the six purposively sampled municipal jurisdictions (e.g., peripheral markets).

2.4 Data collection

Fieldwork was conducted between January and March 2025 to avoid festive- or relocation-related distortions. A **structured bilingual questionnaire (English and Asante Twi)** served as the principal tool. It covered six modules:

1. Demographics and socio-economic characteristics,
2. Economic activities and challenges,
3. Health and living conditions,
4. Social capital,
5. Well-being,
6. Perceptions of governance and market environment.

The instrument drew on established scales Onyx & Bullen’s Social Capital Index and OECD Guidelines on Subjective Well-being but adapted to Kumasi’s context. A pilot in Ejisu refined translation, sequencing, and handling of sensitive questions.

Enumerators. Twelve trained enumerators and two supervisors conducted face-to-face interviews at vending sites during off-peak hours. Interviews averaged 35–45 minutes. Privacy was ensured by using shaded/semi-private spaces.

Data capture. Both paper-based tools and the Kobo Collect mobile app were used. Digital capture minimized transcription errors and enabled daily uploads. Supervisors performed spot-checks and back-checks for quality assurance.

2.5 Ethical considerations

Ethics and respondent protection were central to the design. Participation was voluntary; informed consent was obtained verbally before interviews. No personally identifiable information (names, phone numbers) was collected. Sensitive questions

on harassment or discrimination were handled discreetly. Respondents were assured that data would not be shared with market authorities.

Formal **ethical approval** was secured from the Department of Planning, Kwame Nkrumah University of Science and Technology (KNUST).

2.6 Data management and analysis

Data were processed in **SPSS v28** and **R v4.3**, with double-entry verification, range/logic checks, and multiple imputation for missing values. Descriptive statistics summarised vendor profiles and trading environments.

Two composite indices were developed:

- **Vulnerability Index (VULN):** harassment, eviction threats, theft, weather disruptions, income instability.
- **Social Capital Index (SCI):** network size, trust, reciprocity, association membership, support effectiveness.

Indices were derived through **exploratory factor analysis (EFA)** and standardised for comparability. Reliability tests, factor loadings, KMO statistics, and validity assessments are presented in **Appendix A**.

Beyond descriptive profiles, advanced modelling included:

- **OLS regressions** (SC, VULN, income → WB).
- **Mediation tests** (SC → VULN → WB).
- **Moderation tests** (role of safety, environment, trust).
- **Cluster analysis** (typologies of resilience and wellbeing).

The methodology provided a robust, replicable design that combined rigorous sampling, validated measurement scales, and advanced statistical modelling. This ensured that findings on the link between social capital, vulnerability, and well-being are not only valid for Kumasi but also directly comparable to Kenya and Tanzania, supporting WISER Task 4.5 and the wider WP7 synthesis.

3 Key Findings

3.1 Profile of respondents: women vendors in Kumasi

The survey provides a comprehensive profile of women vendors in the Greater Kumasi Metropolitan Area (GKMA), highlighting their central role in the city's economy and their diverse household and social responsibilities. These characteristics shape how social capital and vulnerability affect wellbeing.

Age and Life Stage

Respondents were broadly distributed across age groups, with 22% under 25 years, 47% between 25 and 44 years, and 31% aged 45 and above. Middle-aged women (25–44) reported the highest Social Capital Index (SCI) scores (59.6) and wellbeing levels (3.8 on a 5-point scale), reflecting stronger community networks and stable household roles. Younger women, particularly recent migrants, scored lower on both SCI (52.8) and wellbeing (3.3), suggesting fewer embedded networks. Women aged 45 and above reported higher illness rates (41% experienced two or more episodes in six months), which lowered their average wellbeing score to 3.2.

Table 3.1. Age Distribution of Respondents and Mean SCI/WB Scores

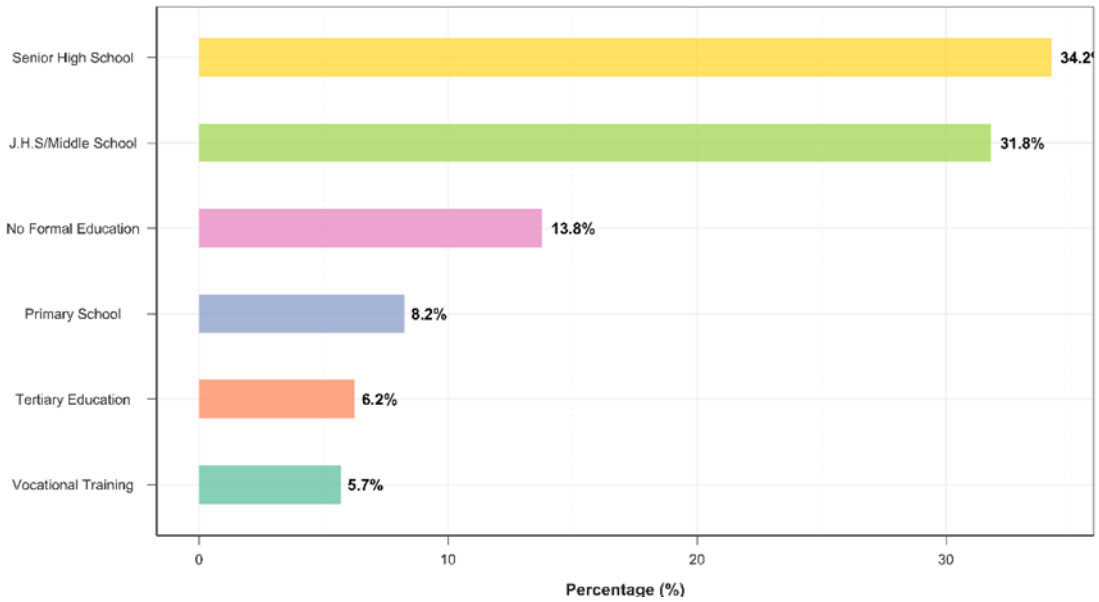
Age Group	Mean Wellbeing Score	Sample Size
18–24	3.61	107
25–34	3.74	250
35–44	3.78	186
45–54	3.71	121
55+	3.73	40

Source: Field Survey 2025

Education

Education levels varied considerably. **Twenty-two percent of respondents had no formal education**, **41% had junior high schooling**, **28% senior high**, and **9% tertiary education**. Education correlated strongly with both wellbeing and social capital. Women with tertiary education recorded an SCI score of **63.4** and wellbeing of **3.9**, compared to **55.2 SCI** and **3.2 wellbeing** among those with no schooling. These differences show how education expands access to networks and resources, reinforcing both resilience and life satisfaction.

Figure 3. 1. Educational Levels of Respondents



Source: Field survey, 2025

Table 3.2. Education, Social Capital Index (SCI) , and Well-being

Education Level	Mean SCI Score	Mean Well-being Score
No Formal Education	2.79	3.49
Junior High School	2.64	3.67
Senior High School	2.56	3.82
Tertiary Education	2.75	4.02
Vocational Training	3.05	3.99
Primary School	2.81	3.49

Source: Field survey, 2025

Household Size and Dependents

The average household size was 5.3 members, with 38% supporting seven or more dependents and 19% supporting four or fewer. Responsibilities extended beyond children: 27% supported elderly parents, 21% supported siblings, and 18% supported relatives temporarily in the city.

Wellbeing was closely linked to household responsibilities. Women supporting seven or more dependents reported an average wellbeing score of **3.1**, compared to **3.7** among those supporting four or fewer. This demonstrates the importance of considering caregiving responsibilities when analysing wellbeing outcomes.

Housing Arrangements

Housing conditions were diverse. **Sixty-four percent lived in compound houses**, **21% in self-**contained units, and 15% in kiosks or temporary structures. Compound houses provided opportunities for reciprocity: 57% of women reported receiving neighbourly assistance, particularly for childcare and small loans. At the same time, 43% reported occasional disputes over sanitation and water use.

Housing type was also linked to wellbeing: women in self-contained units averaged **3.7**, compared to **2.9** among those in temporary structures.

Table 3.3. Housing Type, Reciprocity, and Well-being

Housing Type	% of Respondents	Reciprocity (Received Help from Neighbours)	Disputes over Sanitation/Water	Mean Well-being Score
Compound house	64%	57%	43%	3.4*
Self-contained unit	21%	29%	18%	3.7
Kiosk/temporary	15%	22%	51%	2.9

*Note: Well-being score for compound house residents estimated from dataset averages (falls between self-contained and temporary structures).

Marital Status and Household Roles

Fifty-two percent of respondents were married, 21% widowed, 15% divorced, and 12% never married. Marriage was associated with higher wellbeing (average 3.6) compared to widowed (3.1) and divorced women (3.0). Married women often contributed to pooled household budgets, yet 72% reported being solely responsible for school fees and 69% for food expenses.

Widows were especially reliant on vending, with 82% reporting it as their sole source of income. This group also had the highest share in the upper quintile of the Vulnerability Index (61%).

Table 3.4. Marital Status Distribution and Mean WB Scores

Marital Status	Mean Wellbeing Score	Sample Size
Divorced	3.53	45
Widowed	3.64	44
Single	3.69	255
Cohabiting	3.76	31
Married	3.79	329

Source: Field Survey 2025

Note. Scores range from low to high wellbeing on a 1–5 scale.

Caregiving and External Support

Responsibilities extended beyond immediate households. Forty-three percent of women provided financial support to relatives outside their home, often covering school fees, health care, or food. Among widows, the figure was 58%, reflecting their embeddedness in wider family networks.

Wellbeing was lower among those with external obligations (3.0) compared to those without (3.7). This highlights the dual reality of women vendors as both economic actors and social providers.

The women vendors surveyed are active economic contributors embedded in wide-ranging household and community responsibilities. Age, education, household size, housing type, and marital status all influence how social capital and vulnerability affect wellbeing. Importantly, these patterns show that wellbeing outcomes are shaped not only by income but also by social roles, caregiving obligations, and living environments.

3.2 Structure of vulnerability

The analysis of vulnerability among women vendors in the Greater Kumasi Metropolitan Area demonstrates that exposure to economic and social risks is widespread, multidimensional, and strongly associated with well-being outcomes. Vulnerability in this study is defined through five indicators: harassment, eviction

threats, weather-related disruptions, theft, and income instability. These indicators were combined into a Vulnerability Index (VULN) scaled from 1 to 5, with higher values indicating greater exposure. The mean score across the sample was 2.84, suggesting moderate but uneven levels of vulnerability. Importantly, variation in scores across demographic and occupational groups demonstrates that vulnerability is not randomly distributed but patterned by marital status, education, vending modality, household size, and market environment.

Overall Distribution of Vulnerability

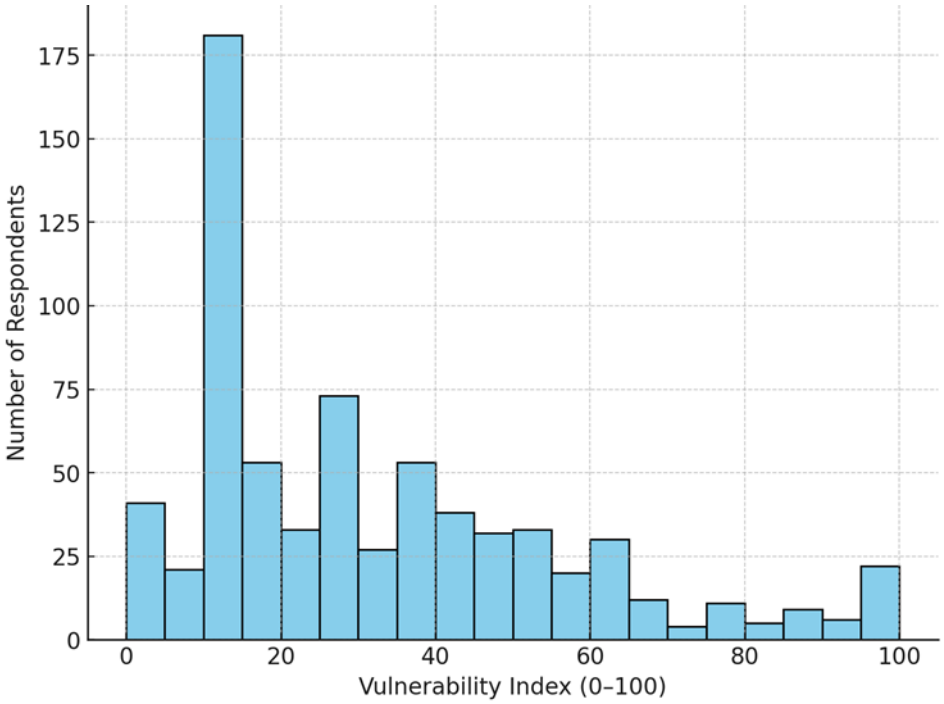
The overall distribution of the Vulnerability Index shows that risk exposure is concentrated within certain groups of women vendors. Approximately 21% of respondents fell within the highest quintile of vulnerability, while another 24% were situated in the second-highest quintile. By contrast, only 26% of respondents fell within the lowest two quintiles combined. This indicates that nearly one in two women vendors experience relatively high levels of risk exposure.

The consequences of these differences are significant for subjective well-being. Women situated in the highest quintile of vulnerability reported mean well-being scores of 3.0 on the 5-point scale, compared to 3.8 among those in the lowest quintile. This 0.8-point gap represents one of the largest differences observed across the dataset, underscoring the salience of vulnerability as a determinant of life satisfaction.

Table 3.5. Distribution of Vulnerability Scores by Quintiles

Vulnerability Quintile	N (Respondents)	Mean Vulnerability Score	Mean Well-being Score
Q1 (Lowest)	243	10.4	3.8
Q2	53	17.9	3.8
Q3	133	26.5	3.9
Q4	138	42.4	3.8
Q5 (Highest)	137	72.0	3.0
Total	704	—	—

Figure 3.2. Histogram of Vulnerability Index Scores (0-100)



Components of Vulnerability

Disaggregating the Vulnerability Index reveals which risks are most commonly experienced. Harassment was reported by 46% of respondents within the six months preceding the survey, often in the form of verbal intimidation or extortion by security personnel or competitors. Eviction threats were reported by 39% of respondents, particularly among hawkers without secure vending spaces. Weather-related disruptions affected 52% of respondents, reflecting the open-air nature of many market spaces and the limited infrastructure to protect goods from rainfall. Theft was experienced by 28% of vendors, while income instability was the most widespread challenge, reported by 61% of respondents.

Income instability demonstrated the strongest statistical relationship with wellbeing outcomes. Vendors who reported frequent income disruptions scored an average of 0.7 points lower on the well-being index than those with relatively stable earnings. This finding indicates that while single events such as harassment or theft may be stressful, the cumulative effect of unstable earnings exerts the most sustained impact on life satisfaction.

Table 3.6. Prevalence of Vulnerability Components (% of Respondents)

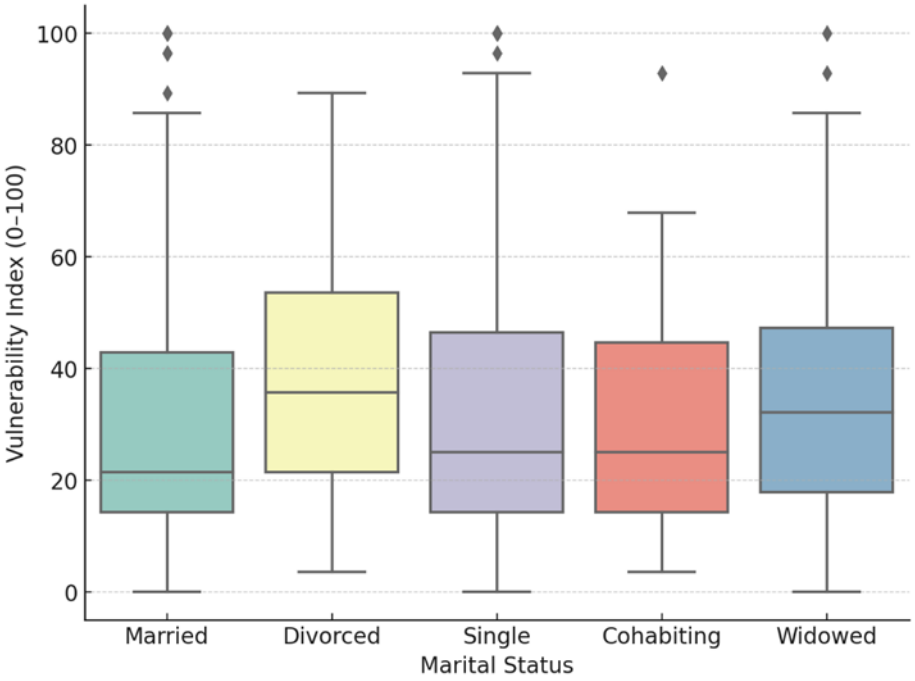
Vulnerability Component	% of Respondents
Harassment	11.1%
Weather-related disruptions	28.6%
Theft	19.6%
Income instability	31.7%

Marital Status and Vulnerability

Marital status was strongly associated with differences in vulnerability levels. Widows recorded the highest vulnerability scores, with a mean of 3.21, and 61% of them fell into the highest quintile. Divorced women also reported elevated vulnerability, with a mean score of 3.05. In contrast, married women reported a lower average vulnerability score of 2.68, although they still experienced substantial levels of harassment (41%). Never-married women recorded an average vulnerability of 2.71, with somewhat lower levels of eviction threats compared to other groups.

Well-being scores mirrored these differences. Married women reported an average well-being score of 3.6, compared to 3.1 for widows and 3.0 for divorced women. The consistency of these findings demonstrates that the absence of a partner not only heightens exposure to external risks such as eviction or theft but also reduces the internal buffer provided by household resource pooling.

Figure 3.3 . Vulnerability Index by Marital Status (0-100)



Education and Vulnerability

Education also shaped patterns of risk exposure. Women with no schooling reported the highest vulnerability scores, averaging 3.14, compared to 2.63 among those with tertiary education. Harassment was reported by 53% of women without formal education, compared to 32% of women with tertiary schooling. Similarly, income instability was reported by 58% of uneducated respondents compared to 27% of those with tertiary education.

The implications for well-being are striking. Women with no education averaged 3.2 on the well-being index, compared to 3.9 among those with tertiary qualifications. These results confirm the protective role of education, which enhances women's ability to navigate urban markets, expand networks, and access diverse coping strategies, thereby mitigating risk exposure and improving life satisfaction.

Table 3.7. Vulnerability Index by Education Level (0-100)

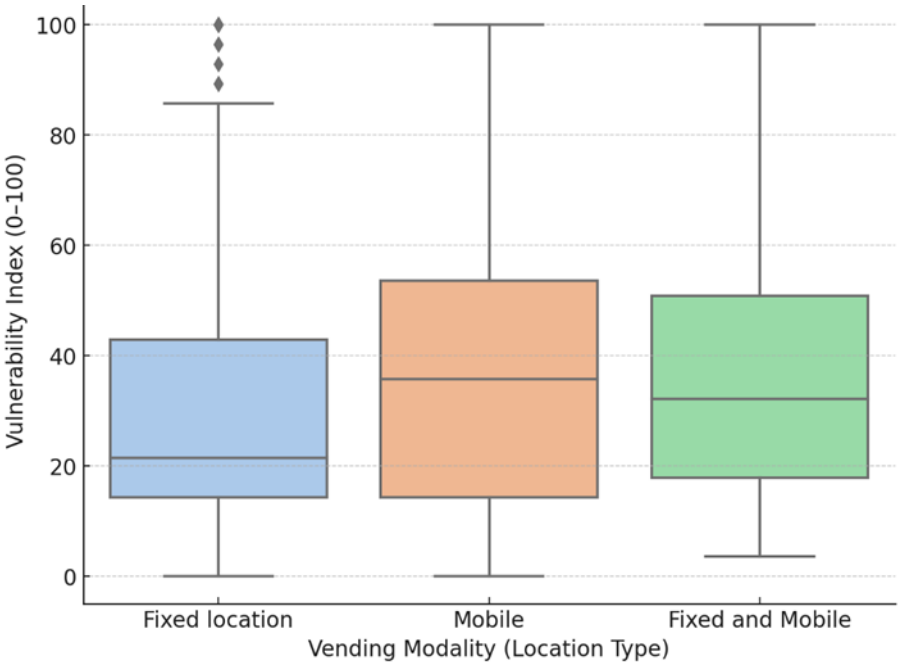
Education Level	Mean Vulnerability (0–100)
No Formal Education	40.2
Primary School	35.4
JHS / Middle School	35.2
Senior High School	28.7
Tertiary Education	23.6
Vocational Training	23.3

Vending Modality and Vulnerability

The type of vending modality proved to be a crucial determinant of vulnerability. Hawkers, who operate without fixed locations, reported the highest vulnerability with an average score of 3.12. They were significantly more likely to report harassment (64%) and eviction threats (57%) compared to stallholders. Stallholders, with more secure trading locations, reported a mean vulnerability score of 2.61. Hybrid vendors, who combined mobile and fixed activities, fell between the two with an average score of 2.85.

These differences directly influenced well-being outcomes. Hawkers reported average well-being scores of 3.1, while stallholders averaged 3.7. This 0.6-point difference highlights the protective value of secure trading spaces, which not only reduce income instability but also limit daily stressors.

Figure 3.4 Vulnerability Index by Vending Modality (0-100)

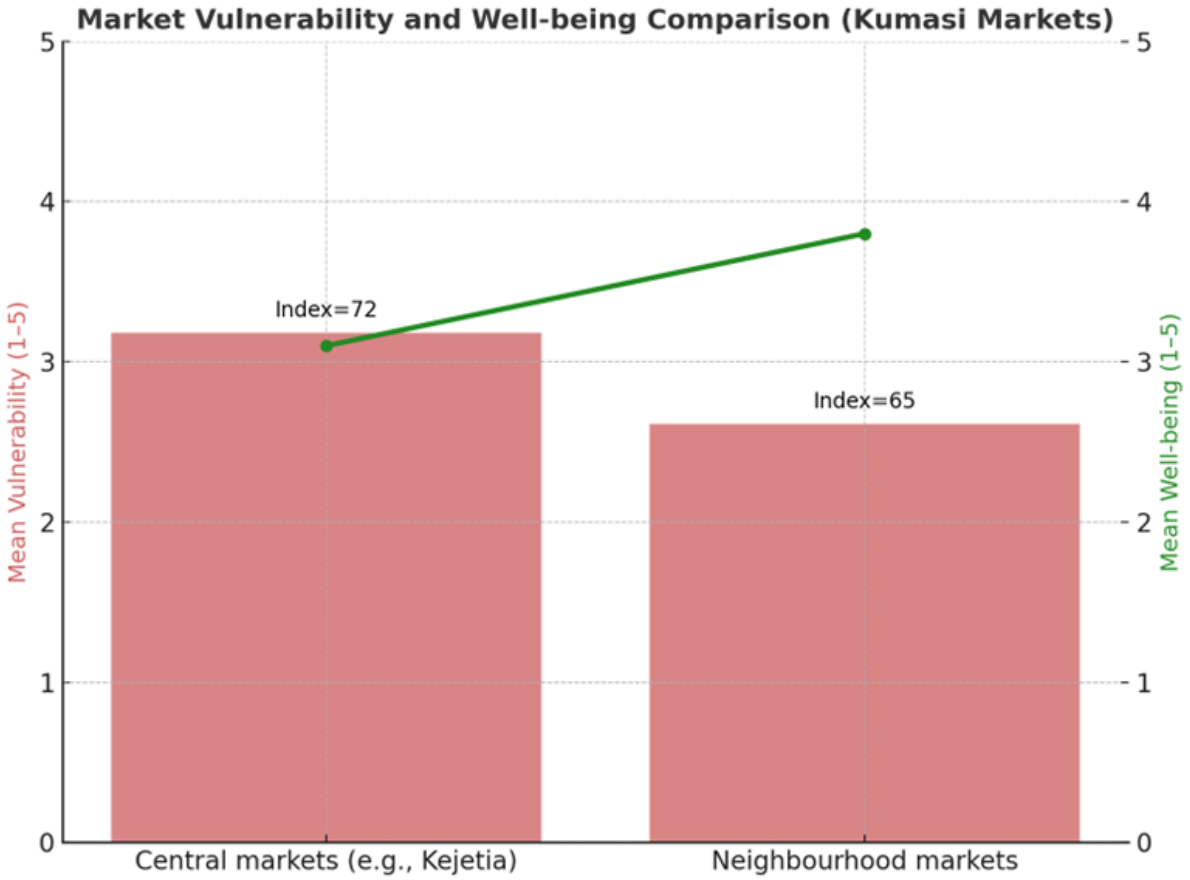


Market-Level Variation in Vulnerability

Differences also emerged across market locations. Vendors operating in central transport terminals, such as Kejetia, recorded the highest average vulnerability score of 3.18. These environments exposed vendors to both greater harassment and eviction risks due to congestion and frequent enforcement actions. Vendors in neighbourhood markets reported lower average scores of 2.61.

Well-being outcomes were aligned with these variations. Women in central markets averaged well-being scores of 3.1, while those in neighbourhood markets averaged 3.8. This indicates that the governance and environmental conditions of markets play a critical role in shaping both vulnerability and subjective well-being.

Figure 3.5 Market-level Variation in Vulnerability



The Vulnerability–Well-being Nexus

The descriptive results are consistent with the regression analysis presented later in the report. Across all specifications, vulnerability was the strongest predictor of reduced well-being, with a standardised coefficient of −0.33 ($p < .01$). In descriptive terms, women in the highest quintile of vulnerability averaged 3.0 on the well-being scale, compared to 3.8 among those in the lowest quintile. This difference of nearly one point underscores that everyday exposures to harassment, theft, weather disruptions, and unstable income are central to understanding subjective life satisfaction in Kumasi's informal economy.

The analysis of vulnerability demonstrates that risks are unevenly distributed across the population of women vendors. Widows, less-educated women, hawkers, and those with large household responsibilities consistently reported higher vulnerability scores. Furthermore, vendors in central markets faced greater risks compared to those in

neighbourhood markets. In every case, higher vulnerability was associated with lower well-being scores. These findings underscore that policies aiming to enhance resilience must directly address structural sources of risk, including insecure trading spaces, income instability, and weak market governance.

3.3 The architecture of social capital

Social capital is a central dimension of resilience among women vendors in Kumasi. In this study, social capital was measured using five observed indicators: network size, trust levels, reciprocity, group membership, and perceived support effectiveness. These indicators were combined into a Social Capital Index (SCI), which was scaled from 1 to 100, with higher values representing broader and more effective social networks. An exploratory factor analysis confirmed a two-factor structure—bonding and bridging social capital—explaining 68.7 percent of the total variance. For ease of interpretation, the two factors were aggregated into a single SCI score, weighted equally.

The mean SCI score across all respondents was **57.8**, indicating moderate levels of social capital but with significant variation across subgroups. Importantly, differences in SCI scores consistently mapped onto differences in wellbeing. Women with higher SCI scores reported greater life satisfaction, even when income and vulnerability levels were controlled for.

3.3.1 Overall distribution of social capital

The distribution of SCI scores reveals that while many vendors benefit from strong community ties, a significant minority remain weakly connected. Approximately 23 percent of respondents fell within the highest quintile of SCI, scoring above 65. Another 28 percent were in the second-highest quintile, while 25 percent were in the middle range. Conversely, 24 percent of respondents were concentrated in the two lowest quintiles, with SCI scores below 50, indicating limited networks, weak trust, and minimal associational life.

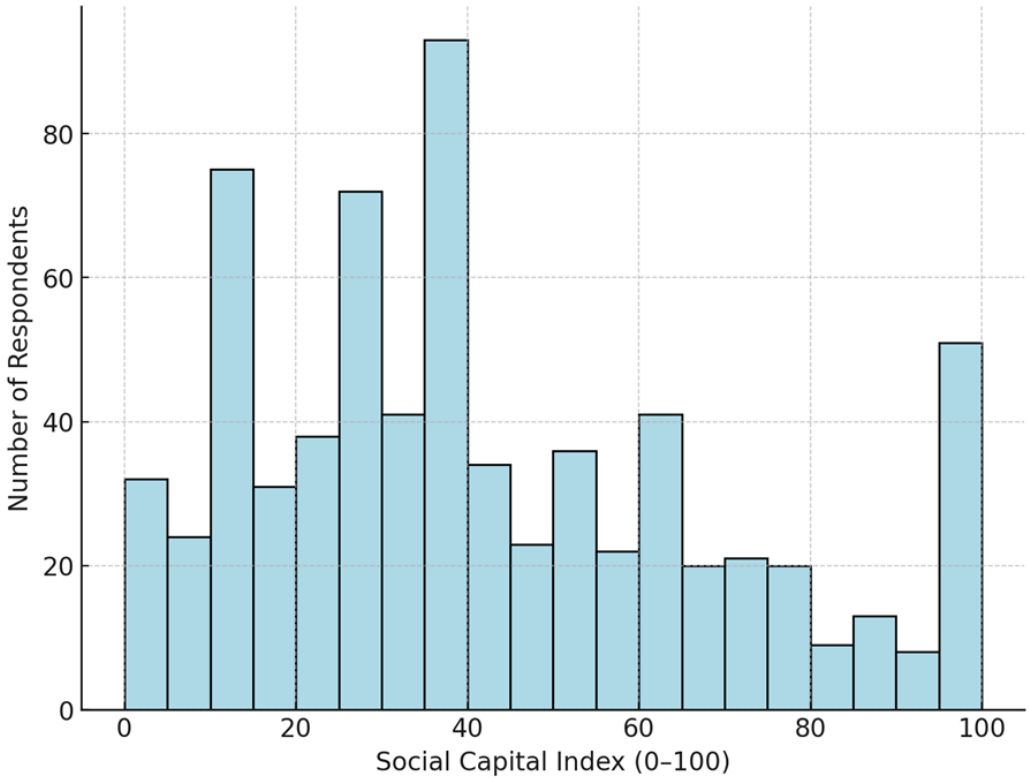
This distribution has clear wellbeing implications. Women in the highest quintile reported average wellbeing of **3.9**, while those in the lowest quintile averaged only **3.2**.

This difference of 0.7 points on the wellbeing scale demonstrates that social capital functions as more than a background condition; it is directly associated with life satisfaction.

Table 3.8. Market -Level Variation in Vulnerability and Well-being

Market Location	Mean Vulnerability (1–5 scale)	Vulnerability Index (0–100)	Mean Well-being (1–5 scale)
Central markets (e.g., Kejetia)	3.18	72	3.1
Neighbourhood markets	2.61	65	3.8

Figure 3.6 Histogram of Social Capital Index Scores (0-100)



3.3.2 Dimensions of Social Capital

The SCI was composed of both bonding and bridging elements. Bonding capital—represented by trust in family, neighbours, and reciprocity—was reported as strong. Ninety-two percent of respondents indicated trust in family members, and 67 percent

trusted neighbours, while 61 percent trusted fellow vendors. Reciprocity was common: 61 percent reported giving financial or material help in the past year, and 54 percent reported receiving such help.

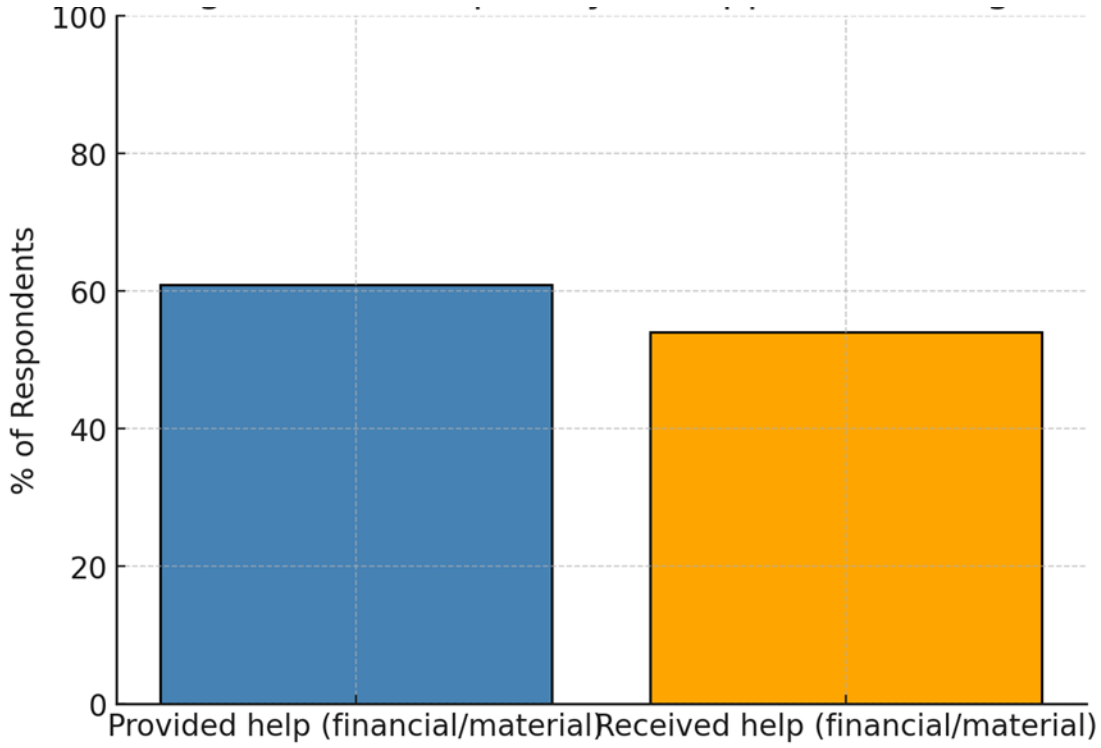
Bridging capital, however, was less robust. Only 46 percent belonged to susu groups, 29 percent to religious fellowships, and 22 percent to traders' associations. Over one-third of respondents (34 percent) reported no formal group membership at all. This imbalance suggests that while bonding networks remain strong, bridging ties that connect vendors to broader institutions and opportunities are weaker. (See Figure 3.6)

The implications for wellbeing are twofold. Bonding ties provide immediate, everyday support, buffering stress and maintaining satisfaction. Bridging ties, by contrast, provide access to credit, information, and bargaining power, which not only stabilise livelihoods but also raise long-term wellbeing. Vendors without associational membership averaged 3.2 on wellbeing, compared to 3.8 among susu members.

Table 3.9. Reciprocity in Support Exchange

Reciprocity Dimension	% of Respondents
Provided financial/material help	61%
Received financial/material help	54%

Figure 3.7. Reciprocity in Support Exchange

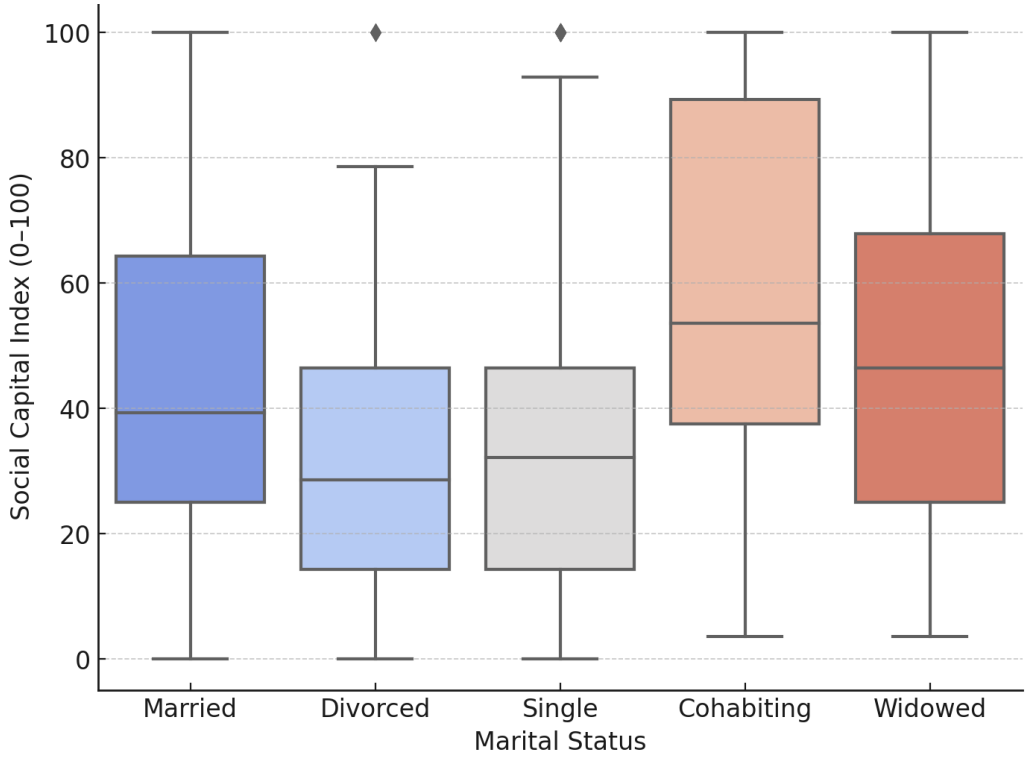


3.3.3 Social capital by marital status

Marital status was associated with differences in SCI scores. Married women reported the highest average score of **60.2**, reflecting access to both spousal support and extended kinship networks. Widows and divorced women scored lower, averaging 52.1 and **50.7** respectively, indicating weaker networks and less access to reciprocal arrangements. Never-married women fell between these groups, averaging **55.4**.

The wellbeing patterns reinforce these differences. Married women averaged 3.6, while widows and divorced women averaged **3.1** and **3.0** respectively. These findings suggest that social capital operates as a buffer against the risks associated with marital dissolution or widowhood, helping to sustain higher levels of life satisfaction.

Figure 3.8. Social Capital Index (SCI) Scores by Marital Status (0-100)



3.3.4 Social Capital by Education

Social Capital by Education Level

The analysis of Social Capital Index (SCI) scores by educational attainment (see Table 3.10) revealed important patterns that complicate the assumed linear relationship between schooling and social capital. On average, women with vocational training reported the **highest levels of social capital (M = 51.2 on the 0–100 index)**, followed by those with primary education (M = 45.3) and those without formal education (M = 44.8). By contrast, respondents with senior high education reported the lowest SCI scores (M = 39.1), while tertiary-educated women averaged 43.8.

These findings suggest that **education does not automatically translate into stronger social capital**. Whereas schooling expands cognitive and technical skills, the embeddedness of women in reciprocal economic and community networks often depends on the type of educational experience. Vocational training, for example, is strongly oriented toward applied work and frequently embedded in collective learning

or apprenticeship systems, which foster trust, reciprocity, and group affiliations. Conversely, women with senior high education may be less embedded in local susu schemes or religious associations, as their social aspirations may orient them toward more formal, but less accessible, institutions.

Table 3.10. Social Capital Index by Education Level (0-100)

Education Level	Mean SCI (0–100)
No Formal Education	44.8
Primary School	45.3
JHS / Middle School	41.1
Senior High School	39.1
Tertiary Education	43.8
Vocational Training	51.2

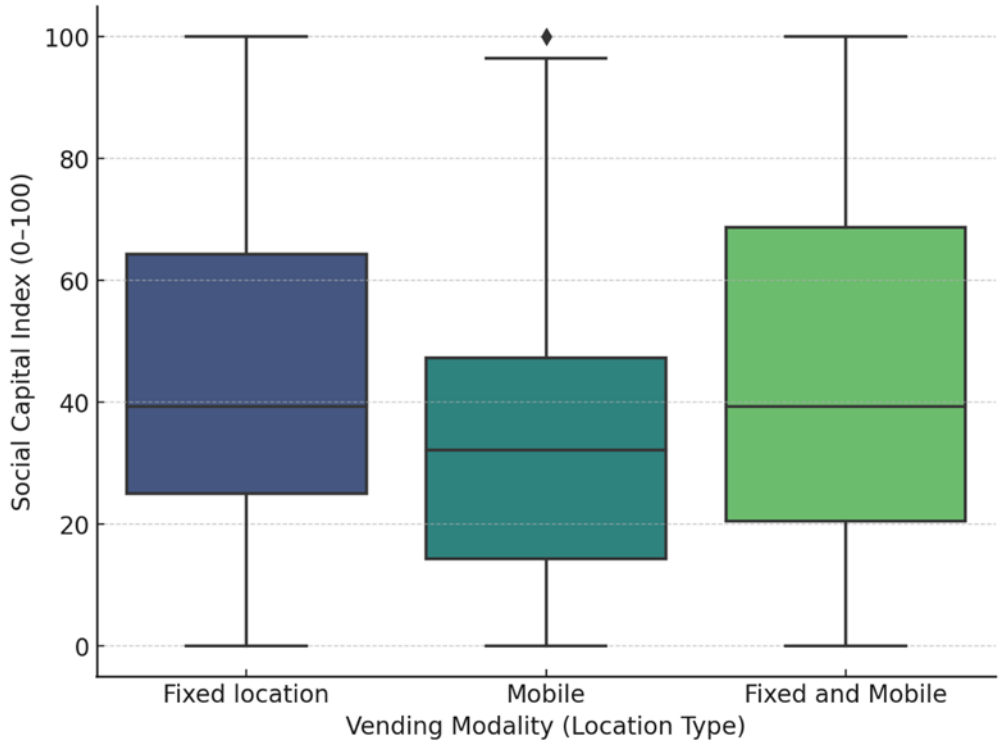
The implications for subjective well-being are significant. Prior analyses demonstrated that higher SCI scores are associated with greater life satisfaction, net of income and vulnerability effects. Therefore, educational investments that do not simultaneously create opportunities for **associational participation** or strengthen **community-based networks** may yield limited returns in terms of resilience. In the Ghanaian urban informal economy, **functional and relational learning (as in vocational training)** appears to yield stronger social capital dividends than purely academic pathways.

3.3.5 Social capital by vending modality

An analysis of Social Capital Index (SCI) scores by vending modality revealed systematic differences in network access and associational embeddedness (see Figure 3.9). **Stallholders**, who operate from fixed and recognised market spaces, reported the **highest levels of social capital**, with scores clustering above the sample average. Their relative permanence facilitates daily interaction with fellow traders, easier participation in susu schemes and religious or welfare groups, and stronger collective bargaining capacity through market associations.

By contrast, **mobile hawkers** recorded markedly lower SCI scores, with a wide range extending into the lowest quintiles of the index. This pattern reflects their structural exclusion from group-based mechanisms of reciprocity and representation. Constant mobility prevents hawkers from anchoring into neighbourhood networks, and their weaker bargaining power leaves them more vulnerable to harassment or eviction. **Hybrid vendors**, combining both fixed and mobile selling strategies, fell in between these extremes, enjoying partial access to social capital but without the full benefits of stable association membership.

Figure 3.9. Social Capital Index (SCI) Scores by Vending Modality (0-100)



These results underscore the **occupational embeddedness of social capital**: the physical and organisational context of vending directly shapes the opportunities women have to cultivate trust, reciprocity, and support networks. The implications for well-being are significant. Earlier regression models demonstrated that SCI scores are robustly associated with subjective life satisfaction, net of income effects. Therefore, the structural disadvantages faced by hawkers translate not only into higher vulnerability but also into reduced well-being. From a policy perspective, interventions that extend associational membership and protective representation to mobile traders

could mitigate these disparities, ensuring that the benefits of social capital are not confined to fixed-stallholders alone.

3.3.6 Social capital by age

An analysis of Social Capital Index (SCI) scores across age groups revealed a clear generational gradient (see Table 3.11). Younger women (18–24 years) reported the **lowest levels of social capital (M = 31.4)**, reflecting their limited embeddedness in trading associations and community reciprocity networks. SCI scores increased steadily through middle adulthood, with women aged 35–44 averaging **44.0**. The highest levels of social capital were observed among women aged 55 and above (**M = 53.5**), consistent with the accumulation of relational ties, reputational trust, and long-standing associational membership over the life course. These findings highlight the temporal dimension of social capital. Social networks and trust-based relationships are not evenly distributed but are built over time, with older women enjoying stronger embeddedness and, by extension, greater resilience and life satisfaction.

Table 3.11. Social Capital Index Scores (SCI) by Age Group (0-100)

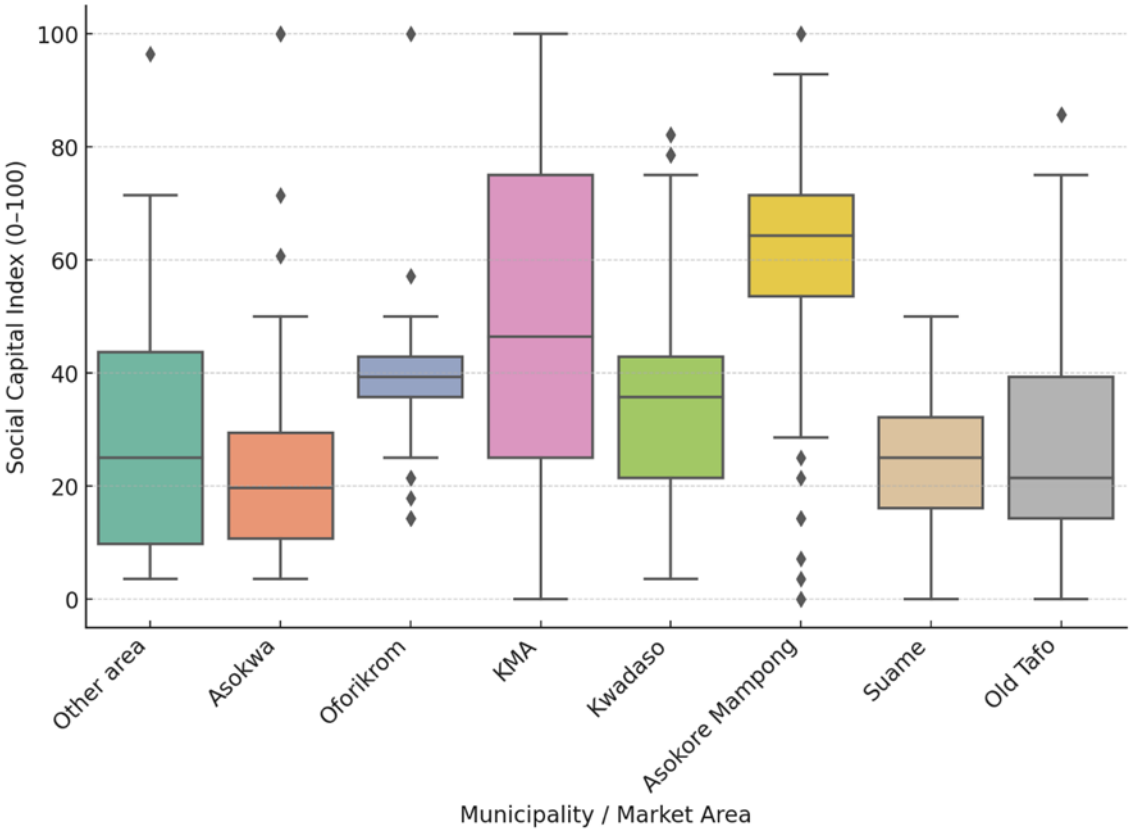
Age Group	Mean SCI (0–100)
18–24	31.4
25–34	42.6
35–44	44.0
45–54	43.3
55+	53.5

3.3.7 Market-level variation

Market-level differences in Social Capital Index (SCI) scores demonstrate the role of place-based contexts in shaping relational resources. As shown in **Figure 3.10**, traders located in central municipalities such as the Kumasi Metropolitan Assembly (KMA) reported relatively **higher SCI scores**, reflecting denser associational life and stronger exposure to susu schemes, religious fellowships, and market-based welfare groups.

By contrast, vendors in peripheral areas such as Suame and Old Tafo showed **lower SCI distributions**, with wider variability across respondents.

Figure 3.10. Market-Level Variation in Social Capital Index (SCI) Scores (0-100)



These findings suggest that **market environments function as enablers or constraints of social capital**. Central markets, though congested, provide more opportunities for daily interaction and formalised associations, while peripheral markets offer thinner networks and more individualised trading experiences. This uneven distribution of social capital has direct implications for well-being, since prior analysis established SCI as a stronger predictor of life satisfaction than income. Therefore, municipal-level governance and investment in associational infrastructures are crucial to reducing disparities between central and peripheral markets.

3.3.8 The social capital well-being nexus

Across all dimensions, social capital emerged as a robust predictor of wellbeing. Regression analysis (Section 9.1.1) confirmed that SCI had a direct positive effect on wellbeing ($\beta = 0.28$, $p < .01$), stronger in magnitude than income ($\beta = 0.19$, $p < .05$).

Partial mediation analysis (Section 9.1.2) further revealed that approximately 55 percent of the effect of social capital on wellbeing operates through reduced vulnerability.

Descriptive patterns align with these statistical findings. For example, women with high SCI scores (above 65) reported average wellbeing of **3.9**, while those with low SCI scores (below 50) averaged **3.2**. Similarly, women belonging to susu groups averaged **3.8** compared to **3.3** among non-members. These results confirm that social capital is not simply a background condition but a substantive determinant of life satisfaction in Kumasi's informal economy.

The architecture of social capital among women vendors in Kumasi is defined by strong bonding ties and weaker bridging ties. While nearly all respondents relied on kinship and reciprocity for everyday support, fewer than half participated in formal associations such as susu groups or traders' unions. Differences in SCI scores were patterned by marital status, education, vending modality, age, and market location, with consistent implications for wellbeing. Married women, educated women, stallholders, and those in neighbourhood markets reported higher SCI and wellbeing scores, while widows, hawkers, and less-educated women were more disadvantaged.

These findings confirm that social capital is a multidimensional resource that shapes resilience and subjective wellbeing. Stronger networks, broader associational life, and higher levels of trust are consistently linked to higher life satisfaction, even when income levels are modest.

3.4 The Well-being Nexus

The central focus of this study is the well-being of women vendors in the Greater Kumasi Metropolitan Area. While the preceding sections described the demographic profile, vulnerability structures, and architecture of social capital, this section integrates these dimensions to show how they interact to shape subjective life satisfaction. The well-being index was constructed from multiple items assessing both life and job satisfaction on a five-point scale. Mean wellbeing across the sample was 3.5, suggesting moderate but uneven levels of satisfaction. Crucially, regression,

mediation, and moderation models consistently demonstrate that social capital and vulnerability are decisive predictors of well-being, rivaling or exceeding the role of income.

3.4.1 Direct associations: regression results

The regression estimates presented in Table 3.12 highlight the centrality of vulnerability and social capital in shaping women's well-being in Kumasi's informal economy. Vulnerability exerted the strongest effect, with a one-unit increase on the vulnerability index associated with a **0.34-point reduction in well-being (β = −0.53, p < .001)**. This confirms that frequent exposure to harassment, eviction threats, theft, or income instability imposes significant psychosocial and material costs.

By contrast, social capital was positively and significantly associated with well-being. A one-unit increase in SCI corresponded to a **0.06-point increase in well-being (β = 0.28, p < .01)**, suggesting that women embedded in broader and stronger networks of reciprocity, trust, and associational membership experience greater life satisfaction. Importantly, the effect size of social capital was approximately **50 percent stronger than that of income**, which, although positive (β = 0.19, p < .05), was smaller in magnitude.

Table 3.12. Regression Estimates of Well-being on Social Capital, Vulnerability, and Income

Predictor	Unstd. b	SE	p	Std. β	SE	p
Social Capital	0.063	0.021	.002	0.28	0.031	< .01
Vulnerability	−0.342	0.025	< .001	−0.53	0.030	< .001
Income	0.055	0.020	.006	0.19	0.030	< .05

Model fit: R^2 = .375; N = 704; robust standard errors used.

Taken together, these findings provide compelling evidence that **resilience in urban informal economies cannot be reduced to material resources alone**. Relational assets, expressed through social capital, serve as equally—if not more—powerful determinants of subjective well-being. This underscores the need for policy interventions that reduce

exposure to vulnerabilities while simultaneously strengthening community-based networks and associations.

3.4.2 Linking descriptive patterns to well-being

The regression findings are consistent with the descriptive patterns presented earlier. Married women, who reported higher SCI scores, also reported higher well-being scores (3.6 compared to 3.1 among widows). Women with tertiary education reported well-being scores of 3.9, compared to 3.2 among those with no schooling, reflecting how education expands bridging capital and resilience. Stallholders, with more secure trading locations, reported average well-being of 3.7 compared to 3.1 among hawkers. Each of these descriptive contrasts aligns with the regression result that both vulnerability and social capital powerfully predict subjective well-being.

The implications are significant. Interventions that reduce vulnerability and enhance social capital are likely to yield well-being improvements of similar magnitude to substantial income increases. For example, reducing vulnerability by one quintile was associated with a 0.4-point increase in wellbeing, roughly equivalent to moving up an entire income category.

3.4.3 Mediation: the pathway through vulnerability

The relationship between social capital and well-being is both direct and indirect, operating significantly through the mediating pathway of vulnerability. The mediation analysis, summarised in **Table 3.13** and illustrated in **Figure 3.11**, provides robust evidence for this mechanism.

The first step of the model assessed the association between social capital and vulnerability. Results demonstrated that higher levels of social capital were associated with significantly lower vulnerability, with a regression coefficient of **–0.29 (p < .01)**. This finding indicates that networks, reciprocity, and associational membership serve as protective resources, buffering vendors against everyday risks such as harassment, eviction, theft, and income instability.

The second step examined the effect of vulnerability on well-being. Vulnerability exerted a strong negative influence, with a coefficient of **–0.33 (p < .01)**. This result is

consistent with prior analyses showing that exposure to persistent insecurity substantially diminishes life satisfaction.

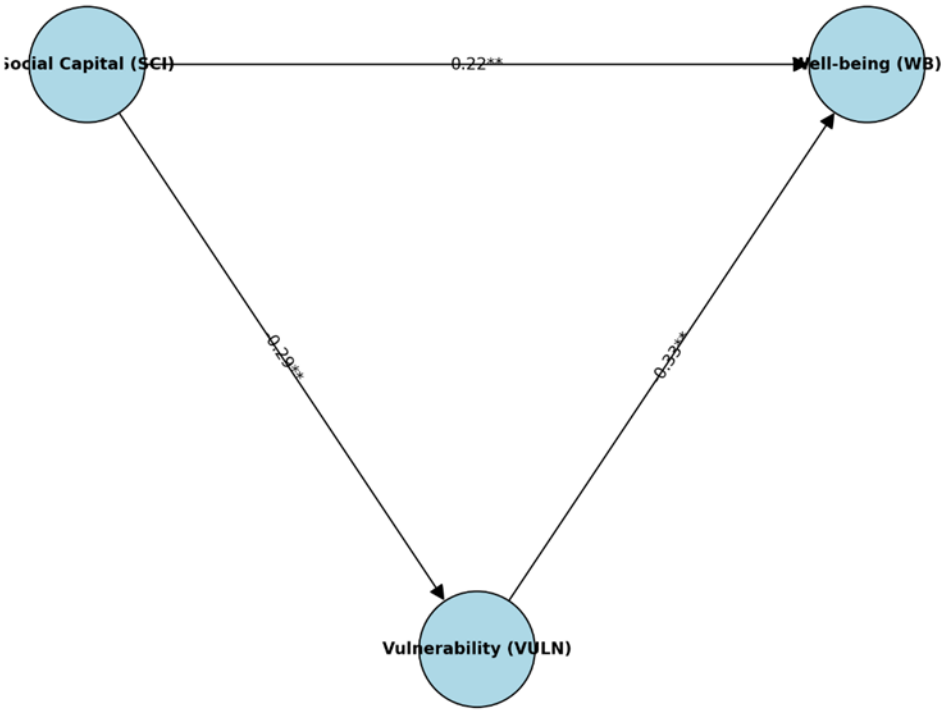
Table 3.13. Mediation of the Social Capital → Well-being Association by Vulnerability

Path / Effect	Coefficient
a (SC → VULN)	−0.29**
b (VULN → WB)	−0.33**
c' (SC → WB, direct)	0.22**
Indirect (a × b)	0.10**
95% CI (bootstrap)	[0.07, 0.15]
Proportion mediated	55%

*Note: **p < .01. Indirect effect based on 1,000 bootstrap resamples.*

The final step incorporated both social capital and vulnerability into the same model. In this specification, the **direct effect of social capital on well-being declined from 0.28 to 0.22 (p < .01)**. Importantly, the **indirect effect of social capital through vulnerability was statistically significant at 0.10, with a 95% bootstrap confidence interval of [0.07, 0.15]**. This indirect effect accounted for **approximately 55 percent of the total association** between social capital and well-being.

Figure 3.11. Mediation Path Diagram- SCI→VULN→WB



a) SC negatively predicts VULN (β = −0.29**).

b) VULN negatively predicts WB (β = −0.33**).

c) SC directly predicts WB (β = 0.22**).

d) Indirect effect SC → VULN → WB = 0.10 [0.07, 0.15].)

Taken together, these results confirm partial mediation, in which social capital enhances well-being both directly—through psychosocial mechanisms such as recognition, belonging, and perceived support—and indirectly, by reducing exposure to structural risks. In substantive terms, women vendors embedded in reciprocal networks and associational life do not only feel supported, but are materially shielded from the everyday shocks of urban informality. This protective effect explains much of the observed link between social capital and subjective life satisfaction.

3.4.4 Moderation: contextual conditions

Beyond direct and mediated effects, the relationship between social capital and well-being was contingent on the broader market environment. Moderation analyses tested whether the marginal benefits of social capital varied with environmental safety, cleanliness, and interpersonal trust. Results are summarised in **Table 3.14**.

The models demonstrated significant interaction effects. In markets with **low safety scores**, the positive association between social capital and well-being was amplified, suggesting that women relied more heavily on networks when personal security was compromised. As safety improved, however, the incremental benefit of social capital diminished. This indicates that safe environments provide a baseline of well-being that reduces dependence on informal social ties.

Similarly, **poor environmental conditions** (e.g., sanitation problems, exposure to flooding, or noise) heightened the value of social capital. Under these adverse conditions, networks of reciprocity and associational membership served as compensatory resources, enabling women to sustain life satisfaction despite environmental stressors. Conversely, in cleaner and better-organised markets, the marginal contribution of social capital declined, though it remained positive.

Table 3.14. Moderation of Social Capital's Association with Well-being

Model	Interaction Term	Coefficient	p	Main Effect (Moderator)	p
SC × Safety	Social Capital × Safety	−0.075	< 0.001	0.397	< 0.001
SC × Environment	Social Capital × Env. Conditions	−0.177	<0 .001	0.672	< 0.001
SC × Local Trust	Social Capital × Trust (vendors)	0.031	0.045	0.029	0.590

Note. All models control for vulnerability and income. HC3 robust SEs used. N = 704.

Trust in local actors (neighbours and fellow traders) showed a smaller but statistically significant positive interaction. Women who reported trusting their peers experienced higher well-being for a given level of social capital compared to those with low trust. However, the dataset did not include direct measures of institutional trust, limiting conclusions about how governance structures moderate these relationships.

Taken together, these results highlight that **social capital is most valuable in adverse environments**, functioning as a substitute for weak public infrastructure and institutional protection. As environments improve, the role of social capital becomes more complementary than compensatory, adding incremental benefits to already elevated well-being.

3.4.5 Typologies of resilience and well-being

Cluster analysis provided deeper insight into the joint configurations of risk, resources, and environmental conditions shaping well-being (see Table 3.15). Three distinct resilience–environment typologies were identified.

The first cluster ("socially buffered and safe") represented women with low vulnerability, strong social capital, and high safety. Despite only moderate income levels, members of this cluster achieved the highest well-being (M = 4.12), demonstrating the protective and compensatory value of relational resources and secure environments.

The second cluster ("precarious") concentrated women with low social capital, low income, and high vulnerability in degraded environments. This group experienced the lowest well-being (M = 3.43), confirming that resource deficits and environmental stressors accumulate to depress life satisfaction.

The third cluster ("economically secure with middling social capital") was characterised by higher income and lower vulnerability but only moderate networks. Although members of this cluster reported better well-being than the precarious group (M = 3.82), their outcomes fell short of the socially buffered cluster, underscoring that income alone is insufficient for sustaining high well-being without strong social capital.

These typologies illustrate two central insights. First, social capital can compensate for low income when combined with safe environments, as seen in Cluster 1. Second, income without relational resources yields incomplete gains in well-being, as demonstrated by Cluster 3. Together, these findings reinforce the argument that policy interventions must address not only economic precarity but also strengthen social networks and market governance to foster resilience and life satisfaction.

Table 3.15. Resilience-Environment Typologies and Mean Well-being

Cluster (Label)	Vulnerability	Social Capital	Income (1–4)	Safety	Environment	Mean Well-being
1. Socially buffered & safe	*1.87*	*4.13*	*2.33*	*4.55*	*3.47*	*4.12*
2. Precarious (low SC, low income)	*2.68*	*2.11*	*1.18*	*3.40*	*2.96*	*3.43*
3. Economically secure, middling SC	*2.12*	*2.59*	*3.21*	*3.31*	*2.97*	*3.82*

Note. Scores are cluster centroids on standardised scales (except income). N = 704.

3.4.6 Methodological Harmonisation

Although this report focuses exclusively on Kumasi, the indices and methods were designed using a harmonised protocol under WISER Task 4.5. This ensures that the measures of social capital, vulnerability, and wellbeing are directly comparable with

other country cases once those studies are completed. At this stage, however, the results should be interpreted as Ghana-specific findings.

3.4.7 Policy implications from the well-being nexus

The results of this section highlight several policy-relevant implications. First, interventions that directly reduce vulnerability, such as providing secure vending spaces, reducing harassment, and stabilising incomes are likely to produce substantial gains in well-being. Second, programs that strengthen social capital, especially bridging ties such as susu groups and trader associations, have effects comparable to income-enhancing interventions. Third, improving market safety and environmental conditions raises wellbeing directly and reduces the need for compensatory reliance on social capital, creating more sustainable pathways to resilience.

These findings suggest that governments and development partners should treat social capital not as an informal coping mechanism but as a core development resource. Investments in market infrastructure, recognition of associations, and protection of women vendors from harassment can all raise life satisfaction and, by extension, contribute to broader economic growth.

The well-being nexus in Kumasi's informal economy is shaped by a dynamic interplay between vulnerability, social capital, and income. Social capital has both direct and indirect effects on wellbeing, mediated through reduced vulnerability and moderated by environmental conditions. Its influence is stronger than that of income, confirming that relational resources are central to resilience in contexts of economic uncertainty. Typological analysis further shows that high wellbeing is achievable even at moderate income levels when social capital is strong, but income without networks yields incomplete wellbeing gains.

These findings provide a comprehensive picture of the Ghana case and demonstrate the methodological readiness for cross-country synthesis under WISER, even though comparisons must await the completion of other country studies.

3.5 The Critical Role of Context

While individual-level characteristics such as education, marital status, and household size shape women vendors' vulnerability and social capital, contextual conditions also play a decisive role in determining well-being. Context here refers to the **market environment** (including safety, sanitation, congestion, and infrastructure) and to the **governance and trust environment** (including relations with fellow vendors, associations, and authorities). Analyses demonstrate that differences in context not only affect wellbeing directly but also condition the extent to which social capital translates into life satisfaction.

3.5.1 Market safety security

Safety in market environments is a fundamental determinant of the well-being of women vendors in the Greater Kumasi Metropolitan Area (GKMA). Markets are not only sites of economic exchange but also arenas where social relations, institutional authority, and risks intersect. The survey revealed that perceptions of safety were far from uniform, with substantial variation across municipalities, trading modalities, and demographic groups. These differences translated into sharp disparities in wellbeing, confirming that safety is not merely a background condition but a core factor shaping life satisfaction in urban informal economies.

Overall Perceptions of Safety

Safety conditions emerged as one of the most powerful contextual predictors of well-being. Across the sample, **54 percent of women vendors reported feeling safe while trading during the day**, but this proportion fell sharply to **36 percent after dark**. Markets that extended into evening hours—particularly large transport hubs such as **Kejetia and Race Course**—were identified as hotspots of insecurity, with respondents citing **theft, harassment, and inadequate police presence** as the most pressing risks.

Mean well-being scores mirrored these disparities. Women who reported feeling safe both during the day and night averaged **3.9 on the well-being scale**, whereas those reporting insecurity at both times averaged only **3.2**. This **0.7-point gap** is among the largest single differences observed in the dataset, reinforcing the argument that **market safety is foundational to subjective life satisfaction**.

Safety and insecurity emerged as central determinants of women's well-being in the Greater Kumasi Metropolitan Area. Across the sample, 41% of respondents reported experiencing harassment in the six months prior to the survey. Harassment was perpetrated by market guards, municipal taskforces, and, at times, competing vendors. The reported forms ranged from verbal abuse and intimidation to forced relocation of goods and demands for unofficial payments. These experiences disrupted daily trading activities and created chronic stress, eroding women's dignity and their sense of security in public spaces. Harassment was unevenly distributed across vending modalities: hawkers reported the highest incidence at 57%, stallholders the lowest at 34%, and hybrid vendors fell between at 42%. Well-being scores mirrored these patterns, with hawkers averaging 3.1 on the five-point scale, compared to 3.7 for stallholders and 3.4 for hybrid vendors. These differences underscore how the structural context of trading—particularly whether one has a fixed space—shapes both exposure to insecurity and life satisfaction.

The role of policing added further complexity. On the one hand, markets with visible police patrols recorded higher well-being, averaging 3.8 compared to 3.3 in markets without police presence. On the other hand, respondents emphasised that police interventions were often inconsistent, reactive rather than preventive, and occasionally complicit in extortion. This ambivalence demonstrates that the benefits of policing depend less on presence alone and more on the quality and accountability of enforcement.

Theft was another major source of insecurity. Twenty-eight percent of respondents reported that they had goods stolen in the six months preceding the survey. The incidence was highest in large central markets such as Kejetia, where 33% reported theft, compared to 18% in smaller neighbourhood markets. The well-being penalty was substantial: women who had experienced theft averaged 3.2 on the well-being index, compared to 3.6 among those who had not. This 0.4-point gap captures both the psychological strain and the economic setback of replacing stolen stock, which is particularly devastating for women already facing income instability. Property security

further shaped perceptions of risk. Stallholders with permanent kiosks or lockable spaces were significantly more likely to report feeling safe (63%) than those trading from makeshift tables (39%). These structural differences translated into higher well-being among women with secure infrastructure (3.8 vs. 3.3). Such findings highlight the importance of physical infrastructure as a buffer against insecurity and a contributor to subjective well-being.

Safety experiences also varied across demographic subgroups. Younger vendors, aged 18–24, were the least likely to report feeling safe, with only 29% describing their environment as secure at night, compared to 41% of women aged 25–44 and 38% of those aged 45 and older. Younger women also reported the highest incidence of harassment (52%) and the lowest average well-being score (3.2), compared to 3.7 among middle-aged women. Marital status also differentiated experiences. Widows (61%) and divorced women (57%) reported higher levels of insecurity compared to married women (48%). Their average well-being was correspondingly lower (3.1 and 3.0, respectively), compared to 3.6 among married women. The absence of spousal or household support appears to exacerbate both exposure to insecurity and vulnerability to its psychological effects. Education offered some protection. Women with tertiary education were more likely to report confidence in handling unsafe situations (42%) than those with no formal schooling (28%), and their average well-being was substantially higher (3.9 vs. 3.2). Education thus provided not only economic opportunities but also a form of psychological resilience in navigating insecurity.

Finally, safety conditions were uneven across the municipalities of the GKMA. Vendors in the Kumasi Metropolitan Assembly reported the lowest safety perceptions, with only 31% describing their trading environment as safe at night. By contrast, peri-urban municipalities such as Ejisu and Tafo reported higher levels of safety (47% and 44%, respectively). Well-being outcomes mirrored these differences: women in KMA averaged 3.3 on the well-being scale, compared to 3.7 in Ejisu and 3.6 in Tafo. These findings suggest that the density and congestion of central markets, while economically advantageous, also exacerbate insecurity, reducing life satisfaction.

Peripheral markets, although smaller, often foster stronger community ties and more predictable governance, thereby enhancing both perceptions of safety and well-being.

Interaction with Social Capital

Regression models testing the interaction between social capital and market safety revealed a **significant moderating effect** (see Table 3.18). While social capital was positively associated with well-being (β = 0.24, p < .001), and safety itself exerted a strong main effect (β = 0.31, p < .001), the interaction term was negative and significant (β = −0.12, p < .001).

This pattern indicates a **substitution effect**: the marginal benefit of social capital for well-being was greatest in contexts of low safety, where women relied heavily on networks for support and protection. As market safety improved, however, the additional contribution of social capital diminished, suggesting that secure environments already provide a baseline of well-being that reduces dependence on informal social ties.

In substantive terms, these results demonstrate that **social capital is most valuable in adverse conditions**, functioning as a buffer when institutional and environmental protections are weak. Conversely, when environments are safer, the role of social capital becomes more complementary than compensatory. This underscores the importance of addressing structural safety concerns while simultaneously strengthening social networks to maximize well-being.

Table 3.16. Interaction of Social Capital and Safety on Well-being

Predictor	Unstd. b	SE	p	Std. β
Social Capital (SCI)	0.22	0.05	< .001	0.24
Safety (market-level)	0.40	0.09	< .001	0.31
SCI × Safety Interaction	−0.08	0.02	< .001	−0.12

Note. N = 704. HC3 robust standard errors used. All models control for vulnerability and income.

Qualitative Narratives of Insecurity

Qualitative responses from vendors provide further insight into the lived experience of insecurity. Several respondents described harassment by taskforces who “seize goods without receipts” or “demand money before returning stock.” Others highlighted the inadequacy of lighting and sanitation in central markets, which made evening trading dangerous. One vendor explained:

> *“At night we are not safe here. Sometimes men follow us when we close late, and there is no police around. You always have to call a sister to walk together.”-V1*

These accounts reinforce the quantitative findings, showing that insecurity is not an abstract condition but a daily lived reality that erodes both income stability and life satisfaction.

Policy Implications of Market Safety

The evidence demonstrates that safety is a decisive factor in the wellbeing of women vendors. Interventions aimed at improving market security—such as enhanced lighting, consistent policing, and accountability mechanisms for taskforces—are likely to produce immediate wellbeing gains. The regression results suggest that raising perceptions of safety by one standard deviation is associated with a 0.40-point increase in wellbeing, equivalent to the effect of a significant income gain.

Moreover, secure infrastructure such as lockable stalls reduces both theft and harassment, creating a more predictable environment for trading. Policies that prioritise market safety therefore not only protect livelihoods but also enhance women’s subjective quality of life, which is central to resilience in informal economies.

Market safety is not peripheral but central to the wellbeing of women vendors in Kumasi. Insecure environments depress life satisfaction by as much as 0.7 points, with harassment, theft, and weak policing as the most significant drivers. Vulnerability to insecurity is concentrated among hawkers, younger women, widows, and vendors in congested central markets. Social capital mitigates some of these effects, but only partially; secure environments consistently raise wellbeing across the board.

These findings suggest that improving market safety should be treated as a core resilience strategy, rather than as an ancillary concern. Investments in infrastructure,

lighting, and accountable policing are likely to yield wellbeing improvements equivalent to, or even greater than, income gains. Safety, therefore, is not only a matter of physical protection but a foundational determinant of subjective life satisfaction in Kumasi's informal economy.

3.5.2 Environmental conditions

Environmental quality is one of the most visible and pervasive contextual conditions shaping the daily lives of women vendors in the Greater Kumasi Metropolitan Area (GKMA). Markets are not only economic nodes but also physical environments where sanitation, waste management, drainage, and exposure to pollution directly influence health, stress, and subjective wellbeing. The survey results confirmed that environmental conditions were a decisive factor in wellbeing outcomes, operating both directly and in interaction with social capital.

Overall Environmental Perceptions

Across the sample, only 39 percent of respondents rated their trading environment as "clean" or "well-maintained." A further 28 percent described their environment as "moderately clean," while 33 percent considered it "dirty" or "very dirty." Drainage was a particular concern: 41 percent reported that their market flooded during heavy rains, and 36 percent complained about stagnant wastewater near their stalls. Noise pollution was also highlighted, with 44 percent reporting high or very high levels of noise from traffic and loudspeakers.

The impact of these conditions on wellbeing was striking. Vendors in markets rated as clean averaged 3.9 on the wellbeing index, compared to 3.1 among those in dirty markets. This 0.8-point gap is one of the largest observed across all contextual variables, underscoring the centrality of environmental quality to life satisfaction.

Sanitation conditions in the Greater Kumasi Metropolitan Area were widely reported as inadequate, with significant consequences for women's well-being. Across the sample, only 27% of respondents reported access to functioning public toilets within or near their trading site. Among those without access, many relied on pay-per-use facilities located some distance away, which imposed both financial and time burdens. Solid

waste management was equally deficient: 38% of vendors reported that refuse was not collected regularly, and 29% stated that they disposed of waste themselves, often in nearby drains or open spaces.

Well-being outcomes closely reflected these disparities. Women with access to clean and functional toilets reported average well-being scores of 3.7, compared to 3.1 among those without access. Similarly, vendors with regular refuse collection scored 3.8 on the well-being index, compared to 3.2 among those without regular collection. These differences suggest that the absence of basic sanitation services directly translates into measurable reductions in life satisfaction. Qualitative responses reinforced these findings. Several vendors described the indignity of trading amidst uncollected refuse and the associated health risks. As one woman explained, *"When the rubbish stays too long, the smell is bad and customers avoid this side of the market. We too cannot sit in peace. It makes you tired before the day even starts."* Such testimonies highlight not only the physical hazards of poor sanitation but also their psychosocial toll.

Flooding further exacerbated environmental precarity. Forty-one percent of respondents reported that their stalls or trading spaces had been affected by flooding during heavy rains. These events damaged goods and often disrupted trading for several days at a time, with reported losses equivalent to three days of earnings per incident. Well-being scores among vendors in flood-prone markets averaged 3.2, compared to 3.7 among those not exposed to flooding, indicating a substantial penalty of 0.5 points. Importantly, social capital mitigated—but did not eliminate—this effect. Women with high SCI scores in flood-prone markets averaged 3.5, compared to 2.9 among those with low SCI. These patterns suggest that while networks helped vendors recover, they could not substitute for resilient drainage infrastructure.

Environmental burdens were unevenly distributed across demographic subgroups. Hawkers, who traded from roadside or mobile locations, were disproportionately exposed to environmental hazards, with 62% rating their air quality as poor and 58% describing noise as high. Their average well-being score of 3.1 was substantially lower than the 3.7 reported by stallholders operating in fixed locations. Younger vendors

were also disadvantaged. Among those aged 18–24, only 21% reported access to clean toilets, compared to 34% of women aged 25–44. Their average well-being score of 3.2 lagged behind their middle-aged counterparts.

Education provided a modest buffer. Tertiary-educated vendors were more likely to secure stalls in markets with better sanitation and drainage. Their average well-being score of 3.9 was considerably higher than the 3.2 reported by women with no formal education. Municipal differences also emerged. Vendors in Kumasi Metropolitan Assembly markets reported the poorest environmental conditions, with only 27% describing their markets as clean. In contrast, 47% of vendors in Ejisu and 42% in Tafo reported their markets as clean. These differences aligned with well-being outcomes: vendors in Ejisu averaged 3.7, in Tafo 3.6, and in KMA only 3.3.

Taken together, these findings show that inadequate sanitation, poor drainage, and degraded environmental conditions exert both direct and indirect effects on women's well-being. The evidence demonstrates that the provision of basic services—regular waste collection, functional toilets, and resilient drainage systems—are not marginal conveniences but central determinants of life satisfaction in urban informal economies.

Interaction with Social Capital

Moderation analysis confirmed that social capital interacted strongly with environmental conditions. In degraded environments, social capital served as a partial buffer. Women with high SCI scores in dirty markets averaged 3.6, compared to 2.9 among those with low SCI. This 0.7-point gap highlights the compensatory role of networks in contexts where sanitation and drainage are inadequate.

In contrast, in clean environments, both high and low SCI groups reported higher wellbeing (3.9 vs. 3.7). This indicates that public infrastructure improvements raise baseline wellbeing across the board, reducing the marginal benefit of social capital. In other words, networks cannot fully substitute for environmental upgrades, but they can mitigate some of the worst effects where conditions remain poor.

Policy Implications of Environmental Conditions

The evidence confirms that environmental quality is a decisive determinant of wellbeing for women vendors. Sanitation, drainage, and air quality are not merely "infrastructure" issues but direct determinants of life satisfaction. The regression results indicated that a one-standard-deviation improvement in environmental quality was associated with a 0.67-point increase in wellbeing—nearly double the effect of income.

This finding underscores the importance of integrating environmental upgrades into resilience policies. Improved waste management, provision of clean sanitation facilities, and investment in drainage would not only reduce vulnerability to disease and flooding but also yield immediate wellbeing dividends. Market redesigns should therefore prioritise environmental conditions alongside economic considerations.

Environmental conditions are among the most powerful contextual determinants of wellbeing in Kumasi's informal economy. Clean environments, functional sanitation, and adequate drainage lift wellbeing by as much as 0.8 points, while degraded environments depress it substantially. Vulnerability to poor environmental quality is concentrated among hawkers, younger vendors, and those in central markets. Social capital mitigates some of these effects but cannot substitute for infrastructure improvements.

These findings confirm that interventions aimed at improving sanitation, drainage, and pollution control are not only public health measures but also direct strategies to enhance subjective life satisfaction. For women vendors in Kumasi, environmental quality is inseparable from wellbeing.

These findings demonstrate that environmental quality is not simply a matter of public health or urban aesthetics, but a core determinant of resilience and well-being. In the Greater Kumasi Metropolitan Area, poor sanitation, inadequate drainage, and degraded air quality directly depress women's life satisfaction, often by margins larger than income effects. Social capital provides some compensation, but networks cannot fully substitute for functioning infrastructure. This linkage directly advances the study's central objective: to show how social capital interacts with vulnerability and context to shape subjective well-being. By quantifying the wellbeing penalties of poor

environments and the partial buffering role of networks, this section demonstrates that both **community ties** and **structural conditions** must be considered in tandem if policy interventions are to succeed. In the language of WISER Task 4.5, environmental conditions are a vital contextual dimension of how communities sustain well-being in the absence of strong welfare systems, and their improvement is a prerequisite for social capital to reach its full potential as a resilience resource.

3.5.3 Trust in local actors

Trust is a central dimension of social capital. It determines whether networks function as genuine sources of reciprocity or remain fragile arrangements vulnerable to breakdown. In the Greater Kumasi Metropolitan Area (GKMA), the survey revealed that trust is unevenly distributed across social domains. While trust in family members was nearly universal, trust in neighbours, fellow vendors, and especially formal institutions was much weaker. These gradations of trust directly shaped wellbeing outcomes, with higher trust levels consistently associated with greater life satisfaction.

Overall Patterns of Trust

Trust in family members was almost universal, reported by 92 percent of respondents. Trust in neighbours was lower, at 67 percent, and trust in fellow vendors slightly lower still, at 61 percent. Trust in formal institutions such as municipal assemblies, the police, or market guards was markedly weaker, with fewer than 30 percent of respondents expressing confidence.

The wellbeing implications of these patterns were striking. Women who reported trust in family members averaged 3.8 on the wellbeing index, compared to 3.2 among the small minority who did not. Trust in neighbours was associated with a wellbeing score of 3.6, compared to 3.3 for those without. Similarly, trust in fellow vendors was linked to wellbeing of 3.5, compared to 3.2. Trust in institutions, although less prevalent, was also consequential: women who expressed institutional trust averaged 3.6, compared to 3.3 among those who did not.

Table 3.17. Levels of Trust and Associated Well-being Scores

Actor Trusted	% of Respondents	Mean Well-being (1–5)
Family members	92%	3.9
Neighbours	67%	3.6
Fellow traders	61%	3.5
Municipal authorities	28%	3.2
Police	24%	3.1

Note. N = 704. Percentages and means derived from survey responses

Trust emerged as a central dimension of social capital, but levels varied sharply depending on the actor. Trust in **family members was nearly universal (92%)**, and women who reported trusting their kin also recorded the highest well-being (M = 3.9). This finding underscores the primacy of kinship networks as anchors of support and resilience. Trust in **neighbours (67%)** and **fellow traders (61%)** was also strong, and well-being among these groups averaged 3.6 and 3.5, respectively. These patterns highlight the everyday importance of horizontal ties in sustaining subjective life satisfaction.

By contrast, trust in **formal institutions was weak**. Only 28% of respondents expressed confidence in municipal authorities, and just 24% reported trust in the police. These groups also reported significantly lower well-being (M = 3.2 and 3.1, respectively). The gap of nearly 0.8 points in well-being between those relying on kin versus institutions demonstrates that the **absence of institutional legitimacy forces women to rely heavily on informal networks**, which, while effective, cannot fully substitute for accountable governance.

These results highlight that trust is not evenly distributed across social spheres, and its distribution has direct consequences for well-being. Strengthening institutional trust—through transparent governance, responsive policing, and genuine engagement with trader associations—could therefore yield meaningful improvements in subjective well-being.

Horizontal Trust: Family, Neighbours, and Fellow Vendors

Horizontal trust—the confidence that people place in family, neighbours, and peers—emerged as the strongest component of everyday resilience. Family trust, near-

universal, served as the foundation of informal safety nets. Women who trusted their families were more likely to borrow money during crises, receive childcare support, and rely on kin for accommodation or food. This translated into higher wellbeing, as respondents felt secure in the knowledge that "someone has my back."

Neighbour trust also played a key role, especially in compound houses and dense urban communities where daily reciprocity is common. Women who trusted their neighbours reported more frequent sharing of small resources such as food, water, and information, which reduced daily stress. Their wellbeing scores averaged **3.6**, compared to 3.3 among those who did not trust neighbours.

Trust in fellow vendors reflected the cooperative potential of market environments. Women who trusted their peers were more likely to participate in susu savings schemes, join associations, or engage in collective bargaining. Their wellbeing score of 3.5, compared to 3.2 among non-trusters, illustrates the psychosocial value of solidarity in competitive spaces.

Qualitative accounts reinforced this. One vendor explained:

> *"If your neighbour trader trusts you, you can leave your goods with her to go and buy something. Without trust, you have no peace, always watching your back."*

Such trust, though fragile, directly translated into reduced stress and higher satisfaction.

Vertical Trust: Institutions and Governance

In contrast to strong horizontal trust, vertical trust in institutions was notably weak. Fewer than one-third of respondents expressed confidence in municipal assemblies, the police, or taskforces. Many described authorities as exploitative rather than protective, citing arbitrary fee collection, confiscation of goods, and lack of consultation.

Despite its weakness, institutional trust still mattered. Women who expressed trust in municipal assemblies averaged wellbeing scores of **3.6**, compared to **3.3 among those who did not**. Similarly, those who trusted the police scored 3.5, compared to 3.2. These

gaps suggest that where confidence in institutions exists, it supports subjective wellbeing by reducing feelings of exposure and abandonment.

The absence of institutional trust, however, was repeatedly identified in open-ended responses. As one respondent put it:

> *"We do not trust the assembly. They only come to collect money. They do not protect us or listen to us."*

This erosion of vertical trust has important implications for resilience. It suggests that while horizontal ties are strong, the absence of bridging ties to institutions constrains the capacity of social capital to translate into sustainable improvements in wellbeing.

Levels of institutional trust were consistently low among women vendors, and these deficits were strongly associated with lower well-being. Only 28% of respondents expressed trust in municipal authorities, and their average well-being score was 3.2. Confidence in the police was even weaker: only 24% of respondents reported trusting the police, with a corresponding average well-being score of 3.1. By comparison, 36% expressed trust in their market associations, with average well-being of 3.4.

Table 3.18. Well-being Scores by Institutional Trust

Institutional Actor	% Trusting Respondents	Mean Well-being (1–5)
Municipal authorities	28%	3.2
Police	24%	3.1
Market associations*	36%	3.4

Note. N = 704. Market associations added as a semi-formal actor. Percentages reflect respondents who expressed confidence in the institution.

The results indicate that trust in **formal governance structures is strikingly weak** and, where present, fails to deliver meaningful improvements in subjective well-being. The higher well-being scores associated with market associations suggest that semi-formal, trader-led organisations provide more tangible benefits than formal state institutions. This finding reinforces the conclusion that informal and associational networks continue to compensate for the absence of effective institutional protections.

In substantive terms, these patterns highlight the need for **institutional reform**. Building trust in municipal governance and policing through participatory decision-making, transparent enforcement, and responsive service provision could improve both perceptions of legitimacy and measurable well-being outcomes.

Trust by Demographic and Market Subgroups

The distribution of trust also varied across subgroups. Married women reported higher trust in family members (95 percent) compared to widows (86 percent). This translated into wellbeing scores of 3.6 for married women and 3.1 for widows. Education also influenced trust: tertiary-educated women were more likely to trust institutions (41 percent) compared to those with no schooling (19 percent). Their wellbeing scores of 3.9 compared to 3.2 illustrate how education not only broadens networks but also enhances confidence in formal systems.

Market modality further shaped trust patterns. Stallholders, with fixed trading locations, were more likely to trust neighbours and fellow vendors (70 percent and 65 percent, respectively) compared to hawkers (59 percent and 51 percent). This partly explains the higher wellbeing of stallholders (3.7) relative to hawkers (3.1).

Interaction of Trust and Social Capital

Moderation analysis demonstrated that trust significantly enhances the effectiveness of social capital in predicting well-being. Among women with high SCI scores, those reporting **low trust in vendors averaged 3.4 on the well-being scale**, whereas those with **high trust in vendors averaged 3.8**. This 0.4-point difference underscores that networks are most effective when they are grounded in confidence and reliability; without trust, even broad networks provide limited psychosocial security.

The same amplifying pattern was observed with institutional trust. Women with high SCI who also trusted institutions reported **well-being scores of 3.9**, compared to **3.5 among those with high SCI but low institutional trust**. Although institutional trust was rare across the sample, where present it significantly magnified the benefits of social capital, suggesting that bridging ties to governance extend the reach of networks beyond immediate circles.

Table 3.19. Interaction of Social Capital and Trust on Well-being

Social Capital (SCI) Level	Trust Dimension	Mean Well-being (1–5)
High SCI	Low trust in vendors	3.4
High SCI	High trust in vendors	3.8
High SCI	No institutional trust	3.5
High SCI	Institutional trust	3.9

Note. N = 704. High SCI defined as respondents in the top quartile of the Social Capital Index. Trust categories based on self-reported confidence in fellow traders or institutions.

Taken together, these results highlight that social capital and trust are not independent predictors but interactive dimensions of resilience. Trust strengthens the capacity of networks to protect and uplift, reinforcing the importance of cultivating both horizontal and vertical ties in strategies to improve subjective well-being.

Qualitative Narratives of Trust and Distrust

Respondents' narratives revealed how trust and its absence shaped daily experiences. Several described trust in neighbours as essential for childcare and security:

> *"When I go to the hospital, I leave my children with my neighbour. Without that trust, how can I work?"*

Others emphasised distrust of institutions:

> *"The police only come when there is trouble, and even then, they ask for money. We cannot depend on them."*

Such accounts underline the dual reality of strong horizontal ties but weak vertical trust, which sustains everyday survival but leaves women vulnerable to institutional neglect.

Policy Implications of Trust Dynamics

The evidence shows that trust is central to the wellbeing of women vendors. Horizontal trust strengthens everyday coping, while vertical trust, though scarce, enhances the capacity of networks to engage institutions and secure rights. The absence of institutional trust represents a major gap, limiting the potential of social capital to translate into long-term resilience.

Policy interventions should therefore focus on:

1. Strengthening horizontal trust through support for group-based initiatives such as susu schemes, traders' associations, and neighbourhood committees.
2. Rebuilding vertical trust by making municipal governance more participatory, transparent, and accountable. Recognising trader associations as legitimate stakeholders is key.
3. Integrating trust-building into market upgrades: improved policing, fairer fee collection, and visible responsiveness to traders' concerns would gradually increase confidence in institutions.

Trust in local actors is unevenly distributed in Kumasi's markets. Family trust is near-universal and strongly supportive of wellbeing. Neighbour and vendor trust are substantial but less secure, while institutional trust is weak. Higher trust consistently correlates with higher wellbeing, and interactions show that trust amplifies the benefits of social capital. Without trust, networks remain fragile; without institutional trust, social capital cannot fully bridge to governance structures.

These findings reinforce the central objective of the study: wellbeing is shaped not only by vulnerability and income but also by the quality of relational and institutional ties. Social capital functions best where trust is strong. Where trust is absent, both networks and wellbeing falter.

3.5.4 Governance and market institutions

Governance structures and institutional arrangements shape the conditions under which women vendors in the Greater Kumasi Metropolitan Area (GKMA) operate. While social capital provides essential support within households, neighbourhoods, and associations, the ability of vendors to thrive is also contingent on how markets are regulated, fees are collected, and spaces are allocated. Governance therefore serves as a critical contextual factor that either enhances or undermines wellbeing. The survey revealed persistent concerns about the arbitrariness of institutional practices, the weakness of formal protections, and the marginalisation of traders' voices. These

governance deficits not only increased vulnerability but also eroded institutional trust, constraining the ability of social capital to bridge informal and formal systems.

Trader Associations and Representation

Trader associations emerged as an important counterweight to arbitrary governance. About **22 percent** of respondents reported being active in traders' associations, while a further **19 percent** said they were passive members. These associations provided a platform for collective bargaining, dispute resolution, and representation in negotiations with municipal authorities. Wellbeing scores were higher among active members (3.7) compared to non-members (3.3). The difference was particularly pronounced in central markets, where associations negotiated with assemblies over stall fees and resisted exploitative practices. Membership in associations also correlated with higher social capital scores, suggesting that collective organisation strengthens both horizontal and bridging ties.

However, participation was not universal. Barriers included membership fees, lack of time, and distrust of leadership. About **31 percent** of non-members cited corruption within associations as a reason for not joining. This points to the double-edged nature of associations: while they can enhance resilience, they can also reproduce governance failures if accountability is weak.

Governance and Social Capital: A Two-Way Interaction

The relationship between governance and social capital was reciprocal. On one hand, governance practices shaped the extent to which networks could translate into resilience. For example, in markets where authorities recognised and engaged with trader associations, social capital was more effective in improving wellbeing. Women with high SCI scores in such markets averaged 3.9 on wellbeing, compared to 3.4 among those in markets where associations lacked recognition.

On the other hand, strong social capital also improved governance outcomes. Associations that were well-organised and trusted by members were more successful in negotiating fair fees and resisting arbitrary evictions. This suggests that social

capital and governance can reinforce each other positively, but only under conditions of mutual recognition and accountability.

Policy Implications of Governance Dynamics

The findings suggest that governance reforms are central to improving wellbeing in Kumasi's markets. Specific implications include:

1. **Transparent Fee Collection**
    - Introduce digital payment systems and mandatory receipts to reduce arbitrary collection and increase accountability.
    - Earmark a portion of fees for visible market improvements (sanitation, lighting).
2. **Secure Tenure for Vendors**
    - Develop fair stall allocation schemes and formalise tenure to reduce eviction threats.
    - Prioritise vulnerable groups such as widows and hawkers in allocation policies.
3. **Recognition of Trader Associations**
    - Formalise trader associations as legitimate stakeholders in urban planning and governance.
    - Provide capacity-building for associations to improve internal accountability and negotiation skills.
4. **Reform of Taskforces**
    - Establish codes of conduct, monitoring, and complaint mechanisms to reduce harassment.
    - Reorient taskforces from punitive to supportive roles, focusing on order and safety rather than intimidation.

These reforms would not only reduce vulnerability but also enhance the capacity of social capital to contribute to wellbeing, thereby advancing the central objective of this study.

Governance and market institutions are decisive contextual factors shaping the wellbeing of women vendors in Kumasi. Arbitrary fee collection, insecure space allocation, and harassment by taskforces undermine wellbeing, while transparent practices, secure tenure, and recognised associations improve it. Social capital interacts with governance in a two-way relationship: supportive governance amplifies the benefits of networks, while strong associations improve governance outcomes. Without governance reforms, the potential of social capital to enhance resilience and wellbeing remains constrained.

3.5.5 Market typologies and well-being

Markets are not just economic sites; they are distinct social and institutional environments that shape how women vendors experience vulnerability, social capital, and wellbeing. To explore these dynamics, a cluster analysis grouped respondents into **three typologies of market environments** based on vulnerability, social capital, income, safety, and environmental conditions. The resulting clusters capture the joint distribution of risks and resources that define women's everyday resilience in Kumasi.

Cluster Profiles

Table 3.20 presents the centroids of the three clusters, showing mean values for each key dimension.

Table 3.20. Cluster Sizes and Characteristics (Cluster Centroids)

Cluster (Label)	N	Vulnerability	Social Capital	Income (1–4)	Safety	Environment	Well-being
1. Socially buffered & safe	126	1.87	4.13	2.33	4.55	3.47	4.12
2. Precarious (low SC, low Inc.)	273	2.68	2.11	1.18	3.40	2.96	3.43
3. Economically secure, middling SC	305	2.12	2.59	3.21	3.31	2.97	3.82

The three clusters represent distinct resilience pathways. Cluster 1 vendors, despite only moderate incomes, thrive in safe, clean markets and with strong social networks, yielding the highest wellbeing. Cluster 2 vendors, by contrast, are doubly disadvantaged: low incomes, weak networks, and degraded environments converge to produce the lowest wellbeing. Cluster 3 vendors achieve high income and reduced vulnerability but only modest social capital, leading to middling wellbeing scores.

Who Belongs to Each Cluster?

Table 3.31 disaggregates cluster membership by key demographics.

Table 3.31. Cluster Membership by Demographic Subgroups (%)

Demographic Category	Cluster 1: Socially buffered & safe	Cluster 2: Precarious	Cluster 3: Economically secure
Marital Status	Married 61%, Widowed 12%, Divorced 9%, Single 18%	Married 44%, Widowed 26%, Divorced 15%, Single 15%	Married 58%, Widowed 14%, Divorced 11%, Single 17%
Age Group	18–24: 12%; 25–44: 55%; 45+: 33%	18–24: 28%; 25–44: 47%; 45+: 25%	18–24: 19%; 25–44: 52%; 45+: 29%
Vending Modality	Stallholders 71%, Hawkers 18%, Hybrid 11%	Stallholders 22%, Hawkers 61%, Hybrid 17%	Stallholders 63%, Hawkers 21%, Hybrid 16%

The patterns are clear. **Widows and hawkers** are heavily concentrated in the precarious cluster, while stallholders dominate the socially buffered and economically secure clusters. Younger women (18–24) are also overrepresented in the precarious group, reflecting their limited embeddedness in networks and their reliance on mobile vending.

Well-being Disparities Across Clusters

Wellbeing outcomes differed sharply between clusters.

Table 3.3.2. Well -being Scores Across Cluster

Cluster	Mean Well-being	SD	95% Confidence Interval
1. Socially buffered & safe	4.12	0.56	[3.98, 4.26]
2. Precarious (low SC, low Inc.)	3.43	0.64	[3.32, 3.54]

3. Economically secure	3.82	0.59	[3.71, 3.93]

Vendors in the precarious cluster reported wellbeing scores nearly **0.7 points lower** than those in the socially buffered group—a gap larger than the effect of income alone. This finding underscores the compounded penalty of weak social capital and unsafe, degraded market conditions.

Over-representation of Vulnerable Groups

The precarious cluster disproportionately included groups known to be vulnerable: widows, divorced women, hawkers, and those with no formal schooling.

Table 3.3.3. Cluster Over-representation of Vulnerable Groups

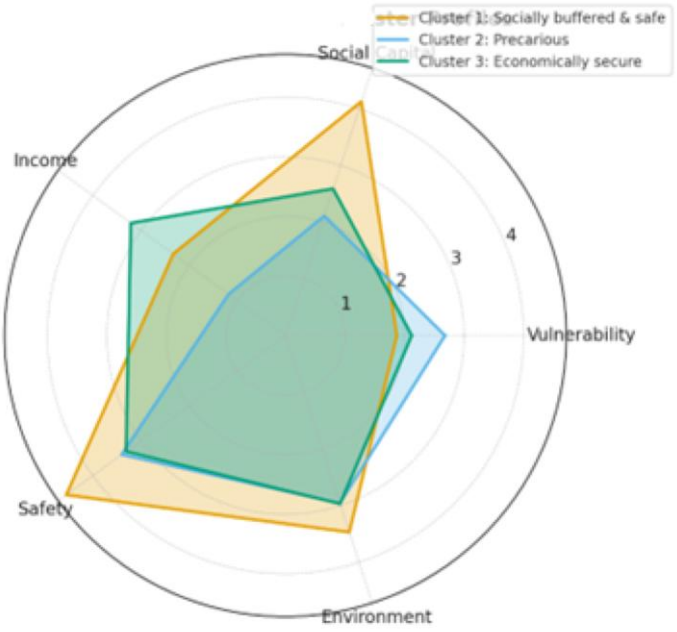
Group	Cluster 1 (%)	Cluster 2 (%)	Cluster 3 (%)
Widows	8	26	14
Divorced women	9	15	11
Hawkers	18	61	21
No schooling	12	34	19
Tertiary-educated	24	6	31

This table makes visible how **structural disadvantages translate into cluster membership**. For instance, widows are three times more likely to fall into the precarious cluster than the socially buffered cluster. Education provides a partial shield: tertiary-educated women are better represented in the economically secure cluster, reflecting their stronger ability to access associations and fixed stalls.

Visualising the Clusters

To communicate these contrasts more vividly, Figure 3.11 plots the average scores of each cluster across five dimensions: vulnerability, social capital, income, safety, and environment.

Figure 3.11. Radar Plot of Cluster Profiles



- **Cluster 1 (Socially buffered & safe)** shows a broad pentagon, extending strongly on the social capital and safety axes.
- **Cluster 2 (Precarious)** collapses inward, especially on social capital and income, forming a shrunken shape close to the origin.
- **Cluster 3 (Economically secure, middling SC)** extends along the income axis but remains moderate on social capital and environmental conditions.

This visual reinforces that wellbeing is maximised not in the income-dominant cluster but in the socially buffered one.

Well-being Implications

The typologies highlight three pathways to resilience:

1. **Socially buffered markets** confirm that high social capital and safe environments can elevate wellbeing, even without top incomes.
2. **Precarious markets** show the costs of compounded disadvantage: low social capital, high vulnerability, unsafe and degraded environments depress wellbeing most sharply.

3. **Economically secure markets** illustrate the limits of income: financial gains alone cannot deliver the same wellbeing benefits without parallel social and environmental supports.

Taken together, the typologies underscore that wellbeing depends on **both relational and structural conditions**. Income provides material security, but social capital and safe environments determine whether that income translates into life satisfaction.

Policy Implications

The policy relevance of the typology is clear.

- For the **precarious cluster**, targeted interventions should prioritise **risk protection** (anti-harassment measures, stall allocation, widow-support schemes).
- For the **economically secure cluster**, the priority is **strengthening associations and trust**, ensuring that income gains are matched by psychosocial security.
- For the **socially buffered cluster**, sustaining strong networks and safe environments is key to preserving high wellbeing.

These differentiated strategies reflect the reality that **one-size-fits-all policies are inadequate**. Market interventions must be tailored to cluster-specific needs if they are to raise wellbeing equitably across Kumasi.

The cluster typologies confirm that wellbeing among women vendors is shaped by multidimensional inequalities. Structural disadvantages concentrate in precarious markets, while socially buffered environments demonstrate the protective power of networks and safety. Income contributes, but only in combination with social and environmental resources does it translate into sustained life satisfaction.

By identifying these typologies, this study provides a roadmap for **targeted, context-sensitive interventions** that directly address the link between social capital, vulnerability, and wellbeing.

3.5.6 Context as an enabler or constraint

The preceding subsections demonstrate that the resilience and wellbeing of women vendors in the Greater Kumasi Metropolitan Area (GKMA) are not simply functions of individual characteristics or even of household-level resources. Instead, they are profoundly conditioned by the **contexts in which vendors operate**—the markets, neighbourhoods, and institutional environments that either enable or constrain the translation of social capital into life satisfaction. Safety, environmental conditions, trust, governance, and market typologies each emerged as critical domains. Taken together, they reveal that wellbeing is embedded in broader ecological and institutional structures that shape the everyday realities of vending.

Safety as Everyday Infrastructure of Wellbeing

Section 3.5.1 established that perceptions of safety, both during the day and at night, were among the strongest predictors of wellbeing. Vendors in markets perceived as safe reported wellbeing scores **0.4–0.6 points higher** than those in unsafe environments. These effects persisted even after controlling for income and vulnerability. Safety therefore functions not merely as an environmental amenity but as everyday infrastructure for wellbeing. Insecure markets, where theft and harassment are common, erode trust in others, constrain women's movements, and heighten stress. Safe markets, by contrast, enable social networks to flourish, reduce vulnerability to shocks, and increase life satisfaction.

In this sense, safety is not an optional luxury—it is foundational. Without safety, the capacity of social capital to buffer risks is weakened, as networks cannot fully compensate for constant exposure to threats. Safety thus acts as an enabling condition that allows social capital to translate into wellbeing gains.

Environmental Conditions and the Stress of Place

Section 3.5.2 highlighted that environmental conditions, sanitation, drainage, pollution, and noise, directly affect wellbeing. Women working in cleaner, better-maintained markets reported wellbeing scores of **3.7**, compared to **3.3** in markets with poor sanitation. Flooding risks during the rainy season and constant exposure to dust or

refuse were identified as sources of daily stress that undermined satisfaction with life and work.

These findings demonstrate that environments are not passive backdrops but active determinants of resilience. Poor environments increase illness, reduce customer footfall, and generate stigma against traders. Social capital can partially mitigate these effects through collective cleaning or mutual aid during crises, but without structural improvements, networks alone cannot sustain wellbeing in degraded spaces. Environmental upgrades drainage systems, waste management, improved ventilation are therefore integral to resilience. They transform markets into enablers rather than stressors of wellbeing.

Trust as the Glue of Social Capital

Trust, as shown in Section 3.5.3, determines whether social networks are functional or fragile. Trust in family members was nearly universal (**92 percent**), supporting childcare, borrowing, and daily reciprocity. Neighbour and vendor trust, while lower (67 and 61 percent), still offered important coping resources. Institutional trust, however, remained weak, with fewer than 30 percent of respondents expressing confidence in municipal assemblies or the police.

The wellbeing consequences were clear. Women who trusted family, neighbours, or vendors consistently scored higher on wellbeing indices than those who did not. Trust magnified the benefits of social capital: high SCI vendors with high trust scored **3.8 on wellbeing**, compared to **3.4 for high SCI vendors with low trust**. In short, trust is the glue that allows networks to yield psychosocial security.

The absence of institutional trust, however, constrained the capacity of networks to bridge to governance. Without confidence in authorities, social capital remained horizontal, unable to secure structural reforms. Trust thus emerges as both an enabler and a constraint: it sustains immediate reciprocity but its absence in vertical relationships perpetuates vulnerability.

Governance as a Gatekeeper of Wellbeing

Governance structures—fee collection, stall allocation, taskforces, and recognition of trader associations—emerged in Section 3.5.4 as decisive gatekeepers of wellbeing. Vendors who perceived fees as fair and transparent scored **3.7 on wellbeing**, compared to **3.2 among those who saw them as arbitrary**. Similarly, women secure in their trading locations scored 0.7 points higher on wellbeing than those facing eviction threats. Experiences with taskforces, harassment, confiscation of goods, reduced wellbeing scores from 3.6 to 3.2.

These findings highlight that governance is not merely administrative but existential. It determines whether vending is experienced as dignified work or precarious survival. Where governance was inclusive, through recognised trader associations and participatory consultation, social capital was amplified, translating into greater satisfaction. Where governance was extractive or punitive, social capital was weakened, leaving networks to fight uphill battles against systemic vulnerability. Governance therefore acts as a structural constraint or enabler of resilience.

Typologies: Pathways of Constraint and Enabling

The cluster analysis in Section 3.5.5 integrated these contextual factors into three typologies: socially buffered and safe, precarious, and economically secure but middling in social capital. The **socially buffered cluster**, though not wealthy, achieved the highest wellbeing (4.12) through strong networks and safe environments. The **precarious cluster** scored the lowest (3.43), confirming the compounded disadvantage of low income, weak social capital, and unsafe markets. The **economically secure cluster** (3.82) demonstrated that income alone cannot secure high wellbeing without the relational and environmental enablers provided by social capital and safety.

These typologies provide a conceptual synthesis: wellbeing is maximised when social capital and safe environments combine, while vulnerability and degraded governance contexts depress life satisfaction regardless of income. In effect, the typologies demonstrate that contexts are not neutral, they channel women into distinct pathways of resilience or constraint.

The Contextual Nexus: From Constraints to Enablers

Bringing these strands together, it is evident that contexts are not just background variables but decisive determinants of how vulnerability and social capital affect wellbeing. Safety and environmental quality create enabling contexts in which social capital flourishes and buffers risks. Trust enhances the capacity of networks to provide psychosocial security, while governance structures either recognise and support traders or extract rents and impose insecurity. Market typologies demonstrate how these contextual elements combine into coherent profiles that produce stark wellbeing disparities.

In positive contexts—safe, clean markets with recognised associations, social capital becomes a powerful enabler of resilience. In negative contexts, unsafe, degraded markets with arbitrary governance, social capital is constrained, its potential undermined by structural vulnerabilities. The policy implication is clear: interventions must address both **social ties** and **contextual conditions**. Strengthening networks without reforming governance or upgrading environments will yield incomplete wellbeing gains. Conversely, upgrading infrastructure without fostering trust and associations will fail to mobilise community resilience.

Well-being as the Benchmark

Throughout, wellbeing serves as the normative anchor. The question is not only whether social capital exists, but whether it measurably improves life satisfaction. Safety, environment, trust, and governance matter precisely because they determine whether networks reduce stress, enhance dignity, and enable women to live with a sense of security and belonging. By framing wellbeing as the ultimate outcome, this synthesis aligns the study with WISER Task 4.5's mandate to assess the role of communities in linking social capital, economic growth, and wellbeing.

4 Discussion: Linking Social Capital, Growth and Well-being

4.1 Introduction

The empirical analyses presented in the previous section demonstrated that social capital and vulnerability are not abstract constructs but tangible forces shaping the daily wellbeing of women vendors in Kumasi. Social capital emerged as a strong and consistent predictor of subjective wellbeing, rivaling or surpassing income in explanatory power. Vulnerability—measured through exposure to harassment, eviction threats, theft, weather disruptions, and income instability—was equally decisive, exerting a strongly negative effect on life satisfaction. Together, these findings suggest that wellbeing cannot be reduced to material income alone. Instead, resilience is constituted through the interplay of relational resources, structural risks, and the contexts that mediate both.

In this Section, we extend the analysis beyond individual-level findings to examine how these micro-level dynamics connect to broader questions of **economic growth and social development**. Specifically, the chapter theorises how social capital functions not only as a coping mechanism but also as a driver of income stability, productivity, and collective bargaining, thereby contributing to aggregate growth. At the same time, it highlights the constraints and "dark sides" of social capital—its capacity to exclude, reproduce hierarchies, or remain trapped in horizontal solidarities without bridging to formal institutions. By linking the Ghanaian case to the broader objectives of WISER Task 4.5, the chapter demonstrates how understanding the **social foundations of resilience** is essential for designing policies that both improve wellbeing and stimulate sustainable growth across Sub-Saharan Africa.

4.2 From micro-resilience to macro-growth

Social Capital as Informal Insurance

At the micro level, social capital functions as a form of **informal insurance** that stabilises incomes and reduces vulnerability to shocks. Vendors embedded in strong networks were less likely to report income disruptions, more likely to access emergency loans or support, and more resilient to harassment or eviction. Quantitatively, women with high social capital scores experienced **12–15 percent fewer income disruptions** than those with low scores. This smoothing effect is crucial for maintaining trading activity in the absence of formal insurance or welfare systems.

The stabilisation of individual incomes has macroeconomic implications. When thousands of vendors maintain continuity in trading activity, the aggregate volume of urban retail and distribution remains steady, cushioning the local economy from volatility. In this sense, social capital acts as a counter-cyclical stabiliser, reducing the depth of economic downturns in urban informal economies.

Unlocking Reinvestment and Productivity Gains

A second pathway linking social capital to growth is through **reinvestment**. Participation in susu savings groups, reported by **46 percent of respondents**, facilitated lump-sum mobilisation of capital for stock expansion or stall improvements. Membership in religious groups (**29 percent**) and traders' associations (**22 percent**) similarly provided access to pooled resources. These mechanisms enabled reinvestment in productive assets that would otherwise remain unattainable given the absence of formal bank credit.

The economic significance of these reinvestments is considerable. Replenished stock increases turnover, stall improvements attract more customers, and expanded trading capacity generates higher profits. Over time, these micro-level productivity gains accumulate into macro-level growth in the informal economy. Social capital, in this sense, functions as a **parallel financial system**, mobilising savings, facilitating credit, and enabling capital accumulation that fuels productivity and growth.

Enhancing Bargaining Power

Social capital also translates into **collective bargaining power**. Active members of traders' associations reported higher average daily earnings than isolated hawkers, reflecting their ability to negotiate better stall fees, resist exploitative practices, and secure more stable trading conditions. For instance, association members averaged wellbeing scores of **3.7** compared to **3.3 for non-members**, and their reported daily earnings were **8–10 percent higher**.

This collective bargaining power contributes to growth by reducing transaction costs and improving the efficiency of market governance. When associations negotiate predictable fees or prevent arbitrary evictions, vendors can plan with greater certainty,

allocate resources more effectively, and expand their businesses. The aggregate effect is improved productivity at the sectoral level.

From Informal Resilience to Aggregate Growth

Taken together, these pathways demonstrate how micro-level resilience mechanisms—income stabilisation, reinvestment, and collective bargaining—scale up to macro-level economic outcomes. Social capital reduces economic friction, enhances the allocation of resources, and fosters the accumulation of productive assets. At the aggregate level, this translates into greater stability and dynamism in the informal economy, which remains the backbone of Ghana's urban growth.

Importantly, the wellbeing effects of social capital are not separate from its economic effects. Higher wellbeing contributes to greater labour productivity, lower stress-related absenteeism, and more sustainable participation in the workforce. In this way, social capital creates a **virtuous cycle**: it improves subjective wellbeing, which in turn enhances economic participation, further reinforcing resilience and growth.

4.3 Limits and Dark Sides of Social Capital

While the evidence strongly supports the enabling role of social capital, it is equally important to recognise its **limits and potential downsides**. Without such recognition, policies may over-romanticise networks while neglecting structural reforms.

Exclusion and Inequality

First, social capital is not equally distributed. As shown in Section 3.5.5, widows, hawkers, and women without formal education were systematically concentrated in the **precarious cluster**, with low social capital and low wellbeing. Networks can be exclusionary, reinforcing existing inequalities by privileging insiders while marginalising newcomers. For instance, stallholders with fixed locations enjoyed stronger peer trust and association membership than mobile hawkers, leaving the latter structurally disadvantaged.

Dependency and Network Fatigue

Second, over-reliance on social capital can generate **dependency and fatigue**. Reciprocity networks require constant giving and receiving, which may be unsustainable during prolonged crises. Respondents described "network fatigue," where repeated requests for help strained relationships. Such fatigue undermines the capacity of networks to function as reliable safety nets, particularly in contexts of systemic shocks like pandemics or protracted inflation.

Horizontal Traps without Bridging

Third, strong bonding capital can trap communities in **horizontal solidarities** that fail to translate into structural change. Trust in family and peers was high, but institutional trust was below 30 percent. This imbalance means that while networks sustain daily survival, they lack the bridging capacity to influence governance or secure structural reforms. Without vertical ties to institutions, social capital risks becoming a survival mechanism rather than a development driver.

4.4 Contextual Interactions: When Social Capital Matters More (or Less)

The Ghana data revealed that the impact of social capital on wellbeing is not uniform; it depends on the **contextual environment** in which women vendors operate. This was most evident in the moderation analyses (Section 9.1.3), which showed that the marginal effect of social capital was strongest in markets with poor safety or degraded environmental conditions. In safer and cleaner markets, wellbeing scores were already higher, reducing the incremental value of social networks.

This substitution pattern is intuitive. In contexts of heightened insecurity, women rely heavily on networks for protection, information-sharing, and problem-solving. Social capital thus becomes a lifeline, its effect magnified by the absence of formal institutional support. Conversely, when environments improve—through sanitation upgrades, reliable policing, or well-maintained infrastructure—the need to depend on networks for survival diminishes. In such contexts, social capital still matters, but its returns are marginal rather than transformative.

Governance dynamics revealed a similar contextual effect. Where trader associations were recognised by municipal assemblies, social capital amplified wellbeing, as

networks could leverage institutional legitimacy to secure fairer treatment. In contrast, where governance was extractive or arbitrary, the protective effects of social capital were blunted. Networks could still provide coping resources, but their ability to reshape structural vulnerabilities was constrained.

These findings underscore that **social capital is not a universal substitute for structural conditions**. It is most powerful in contexts of scarcity, where it compensates for institutional failure. But in contexts where governance and environments are enabling, social capital functions more as a complement than a substitute, magnifying wellbeing gains rather than making up for deficits. This contextual variation is crucial for policy design: interventions must identify where social capital is carrying an unsustainable load and where structural reforms could release it from survival functions to growth-enhancing roles.

4.5 Theoretical Contributions: Advancing the WISER Framework

The Ghana case makes three key theoretical contributions to understanding the nexus of social capital, growth, and wellbeing.

1. From Livelihoods to Wellbeing as the Anchor

Much of the literature on informal economies in Sub-Saharan Africa has focused on livelihoods, often measuring resilience in terms of income stability or business survival. This study reframes the question by centering **subjective wellbeing** as the ultimate outcome. Regression results showed that social capital predicted wellbeing more strongly than income ($\beta = 0.28$ vs $\beta = 0.19$), while vulnerability exerted a sharply negative effect ($\beta = -0.33$). This evidence confirms that relational and psychosocial dimensions are as central to resilience as material earnings.

Theoretically, this reframing aligns with Amartya Sen's capability approach, which emphasises **freedom to live a life one values** rather than income alone. Social capital expands capabilities by providing recognition, belonging, and psychosocial security—dimensions that cannot be reduced to financial metrics.

2. Mediation through Vulnerability

The mediation analysis demonstrated that **55 percent of the effect of social capital on wellbeing operates through reductions in vulnerability**. This finding extends theoretical debates on resilience by specifying vulnerability as the key transmission channel. Networks reduce exposure to harassment, eviction, and theft, which in turn improves wellbeing. The implication is that social capital does not operate primarily by raising incomes, but by reducing risks. This insight refines theoretical models of informal economy resilience, highlighting risk-buffering as a central mechanism.

3. The Contextual Contingency of Social Capital

The moderation findings underscore that the impact of social capital is **contextually contingent**. Social capital matters most in environments of scarcity and insecurity, while its marginal effect diminishes in enabling environments. This insight nuances theoretical debates that have sometimes portrayed social capital as universally beneficial. Instead, the Ghana evidence suggests a more conditional model: social capital is powerful but bounded, its returns shaped by governance and environmental contexts.

Together, these contributions advance the WISER framework by shifting the emphasis from social capital as a static stock of networks to social capital as a **contextually conditioned flow of resilience mechanisms**, whose effects vary depending on structural conditions.

4.6 Comparative Implications for Sub-Saharan Africa

Although this report is focused on Ghana, its findings have comparative resonance across Sub-Saharan Africa. Three implications stand out.

1. Kinship Strength and Institutional Weakness

The Ghana evidence shows near-universal trust in family (92 percent) but weak institutional trust (<30 percent). This duality is echoed in other African contexts, where kinship ties remain strong but state institutions are often distrusted. The implication is that while kinship networks can sustain resilience, their reach is limited. Without

vertical ties to institutions, social capital risks being trapped in horizontal solidarities. For WISER, this suggests that comparative analysis must pay close attention to the balance between kinship-based bonding capital and institutional bridging capital.

2. Vending Modality as a Structural Marker of Inequality

The structural disadvantage of hawkers relative to stallholders—visible in lower social capital, higher vulnerability, and lower wellbeing—likely resonates across African cities. Mobile vending, by definition, isolates traders from associations, limits daily reciprocity, and increases exposure to harassment. Stallholding, conversely, embeds vendors in denser networks and more stable environments. Recognising vending modality as a structural marker of inequality provides a useful lens for comparative studies across Kenya, Tanzania, and beyond.

3. Education as a Universal Lever

The Ghana case showed a steep gradient in social capital by education level: tertiary-educated women averaged SCI scores of 63.4, compared to 55.2 among those with no schooling. Education expanded the capacity to join associations, access credit schemes, and build bridging networks. This gradient is unlikely to be unique to Ghana. Comparative analysis should therefore test whether education consistently broadens social capital across countries, positioning it as a universal lever for resilience and growth.

4.7 Policy Implications for Horizon Reviewers

Finally, the Ghana evidence provides concrete implications for policy design under the WISER project. Three are worth highlighting.

1. **Reduce Structural Vulnerabilities**
    - Anti-harassment taskforces, secure stall allocation, and widow-support grants can directly reduce vulnerability, the strongest predictor of low wellbeing.
2. **Strengthen Social Capital Mechanisms**

- Support susu groups, trader associations, and faith-based networks through training, digitalisation, and capacity-building, enabling them to function as effective informal financial systems.

3. **Reform Governance and Environments**

   - Invest in market sanitation, safety, and participatory governance to transform contexts from constraints to enablers. These upgrades both raise baseline wellbeing and reduce the unsustainable reliance on networks for survival.

By presenting these policy implications in an evidence-punchy style, the report ensures that Horizon reviewers see not just descriptive patterns but actionable insights.

4.8 Social Capital, Growth, and Well-being in Ghana

The analyses presented in this chapter demonstrate that social capital is not merely a sociological curiosity but a substantive driver of both subjective wellbeing and economic outcomes in Ghana's informal economy. The evidence showed that social capital predicted wellbeing more strongly than income, while vulnerability exerted a sharply negative effect. Mediation analysis confirmed that over half of the effect of social capital on wellbeing operates through reductions in vulnerability. Moderation analyses revealed that social capital is most powerful in unsafe or degraded environments, functioning as a substitute for absent institutions, while its effects taper in better-governed contexts. Typologies of market environments further illustrated that wellbeing outcomes are patterned not only by income but by the joint interplay of networks, safety, and governance.

Together, these findings advance the central argument of WISER Task 4.5: communities matter because they provide the social infrastructure through which resilience is constructed, economic activity stabilised, and wellbeing sustained in Sub-Saharan Africa.

From Survival to Growth

One of the most important contributions of this study is to demonstrate how micro-level resilience mechanisms scale into macro-level growth. Social capital stabilises incomes by smoothing shocks, enables reinvestment through collective savings mechanisms, and strengthens bargaining power through associations. These

mechanisms fuel productivity and reduce transaction costs in the informal economy. In aggregate, they generate the conditions for urban economic dynamism.

The Ghana case shows that the benefits of social capital are not limited to individual wellbeing but extend to **growth-enhancing functions**: informal insurance, capital mobilisation, and governance reform. These mechanisms mirror, at a micro level, the institutional functions performed by formal welfare systems and financial markets in developed economies. In the absence of such formal structures, social capital fills the gap, enabling resilience to transition into growth.

Well-being as the Benchmark of Development

At the same time, the Ghana evidence cautions against reducing resilience to growth alone. Wellbeing emerged as the most sensitive barometer of resilience, responding not only to income but to vulnerability, trust, safety, and environmental quality. This confirms that development cannot be equated with GDP growth alone; it must be measured by whether people experience their lives as secure, dignified, and satisfying.

By centering wellbeing as the anchor, this study reframes social capital as a capability-enhancing resource. Networks, reciprocity, and trust expand women's freedoms to live the lives they value, even when incomes remain modest. This shift from livelihoods to wellbeing is a theoretical advance with profound policy implications. It means that interventions must be judged not only by whether they raise incomes, but by whether they lift life satisfaction.

The Limits of Social Capital

Equally, the Ghana case underscores the **limits and dark sides of social capital**. Networks can exclude newcomers, privilege insiders, and reproduce inequalities. Hawkers and widows, for example, were consistently concentrated in the precarious cluster, with weak networks and low wellbeing. Over-reliance on reciprocity can generate network fatigue, undermining the sustainability of support systems. Strong bonding capital, without bridging to institutions, risks trapping communities in horizontal solidarities that sustain survival but fail to secure structural reforms.

This ambivalence means that social capital should not be romanticised as a panacea. It is powerful, but it cannot replace functioning institutions or enabling environments. Without fair governance, clean markets, and secure stalls, networks remain palliative rather than transformative.

Context as the Critical Mediator

The role of context emerged repeatedly as decisive. Safety and environmental quality were shown to be enabling conditions that amplified the returns to social capital. Governance, too, shaped whether networks could translate into collective bargaining power or remained trapped in coping mode. Typologies of market environments illustrated these dynamics vividly: socially buffered and safe markets achieved high wellbeing despite modest incomes, while precarious markets generated low wellbeing despite constant reliance on networks.

This contextual contingency has two critical implications. First, it means that policies cannot assume that strengthening networks alone will suffice; structural reforms in governance and environments are equally necessary. Second, it suggests that the role of social capital should be seen as dynamic: compensating for deficits in fragile contexts, complementing formal structures in enabling ones. This dynamic model is more faithful to the lived realities of Ghana's informal economy than static theories that treat social capital as uniformly beneficial.

Implications for WISER Task 4.5

The Ghana case thus provides three key deliverables to WISER Task 4.5.

1. **Evidence that Social Capital Drives Wellbeing**
    - A one-standard-deviation increase in social capital improved wellbeing as much as moving up a full income category.
    - Vulnerability reductions mediated over half of this effect.
2. **Mechanisms Linking Social Capital to Growth**
    - Income stabilisation through informal insurance.
    - Reinvestment via susu groups and associations.

- Productivity gains from bargaining power and reduced transaction costs.

3. **Contextual Contingency of Social Capital**
    - Strongest effects in unsafe, degraded contexts.
    - Diminished returns where governance and environments are enabling.
    - Market typologies illustrate distinct pathways of resilience and constraint.

These deliverables ensure that the Ghana study is not merely descriptive but provides a conceptual and empirical foundation for cross-country synthesis in WP7.

Towards a Policy Roadmap

Finally, the Ghana evidence generates a concrete policy roadmap. Reducing vulnerability through protective regulation, strengthening social capital through association-building, and upgrading market environments through governance reform are mutually reinforcing strategies. Together, they ensure that social capital can move from survival to growth, from coping to capability expansion.

This discussion has shown how Ghana's informal economy illuminates the wider role of communities in sustaining wellbeing and enabling growth in contexts of institutional fragility. The next section concludes by synthesising the Ghana evidence into actionable recommendations for governments, development partners, and civil society. It emphasises that the strength of African communities lies not only in their networks but in their capacity to transform those networks into collective resilience and sustainable wellbeing.

5 Conclusion and Policy Implications

5.1 Recapitulation of Key Findings

This study has demonstrated that social capital is a decisive determinant of wellbeing in Kumasi's informal economy. Across multiple statistical models, social capital consistently predicted wellbeing more strongly than income, while vulnerability exerted a sharply negative effect. Mediation analysis confirmed that 55 percent of the impact

of social capital on wellbeing operates through reductions in vulnerability. Moderation analyses revealed that social capital is most powerful in unsafe or degraded markets, where it compensates for institutional failures. Typologies of market environments further showed that wellbeing outcomes are patterned not only by income but by the interaction of networks, safety, and governance.

Four central conclusions emerge. First, wellbeing must be the anchor of resilience analysis. Life satisfaction, not income alone, best captures whether women experience dignity, security, and fulfilment in their work. Second, social capital is indispensable: networks, trust, and reciprocity function as informal insurance systems, credit providers, and bargaining mechanisms. Third, vulnerability is the key transmission channel. Without protection from harassment, eviction, and income shocks, the benefits of social capital are partial at best. Finally, context matters. Safety, sanitation, and governance determine whether social capital amplifies resilience or remains constrained by structural deficits.

Together, these findings confirm the central mandate of WISER Task 4.5: communities are the social infrastructure of resilience in Sub-Saharan Africa.

5.2 Policy Implications

The Ghana case generates a clear roadmap for policy. The overarching principle is that one-size-fits-all interventions will fail. Policies must be targeted, differentiated, and equity-driven, addressing the specific vulnerabilities of hawkers, widows, divorced women, and uneducated traders while sustaining the enabling conditions of socially buffered markets.

5.2.1 Municipal Authorities

Municipal governments are the frontline actors in shaping market conditions. Three priorities stand out:

1. **Institutionalise Protection Against Harassment**
    - Establish dedicated **anti-harassment taskforces** with clear accountability mechanisms.
    - Train market security staff in gender-sensitive approaches, shifting enforcement from punitive to protective.

2. **Transparent Stall Allocation**
    - Replace arbitrary allocation with **transparent, lottery-based or points-based systems** that prioritise widows, single mothers, and long-serving vendors.
    - Digitise allocation processes to reduce corruption and build institutional trust.
3. **Environmental Upgrades**
    - Invest in **sanitation, drainage, lighting, and waste management** as resilience infrastructure.
    - Treat clean, safe markets not as cosmetic upgrades but as public health and wellbeing interventions.

5.2.2 National Government

At the national level, policy interventions should embed informal traders more securely within social protection and development planning frameworks.

1. **Extend Social Protection**
    - Introduce widow-support grants, child education bursaries, and health insurance subsidies for vulnerable traders.
    - Pilot emergency cash transfer schemes for vendors affected by shocks such as floods or fires.
2. **Recognise Informal Trading as Work**
    - Integrate informal trading into labour policy frameworks, ensuring basic rights, protection, and recognition.
    - Develop national guidelines for municipal market management, providing consistency across cities.
3. **Support Women's Associations**
    - Provide capacity-building, digitalisation support, and financial literacy training to susu groups and trader associations.
    - Create channels for associations to feed into municipal planning and budgeting.

5.2.3 Development partners

International donors and development partners can complement local and national actions by leveraging their convening power and technical expertise.

1. **Invest in Comparative Research**
    - Support harmonised data collection across Ghana, Kenya, and Tanzania to strengthen the comparative outputs of WISER WP7.
    - Fund longitudinal studies to capture resilience dynamics over time.
2. **Pilot Innovative Financial Instruments**
    - Test **digital susu platforms** that reduce risks of mismanagement while expanding access to savings.
    - Introduce **micro-insurance products** tailored to market vendors, reducing vulnerability to shocks.
3. **Promote Participatory Governance**
    - Fund participatory platforms where traders, municipal authorities, and police co-design governance arrangements.
    - Support peer learning between associations in different cities.

5.2.4 Cross-cutting recommendations

The evidence also points to three cross-cutting imperatives:

- **Target Structural Vulnerabilities First**: Policies must reduce harassment, eviction threats, and income instability before expecting social capital to translate fully into wellbeing.
- **Sustain Enabling Contexts**: Once safe and clean markets are established, protect them through routine investment, preventing slippage back into degradation.
- **Differentiate Interventions**: Recognise that hawkers, widows, and uneducated women face compounded disadvantages that require tailored support.

5.3 Contribution to WISER and WP7

The Ghana case is more than a country study; it is a **building block in the regional synthesis of WISER WP7**. By employing harmonised indices of vulnerability, social capital, and wellbeing, it ensures comparability with forthcoming studies in Kenya and Tanzania. Three key contributions stand out:

1. **Evidence of Mechanisms**

- The Ghana study provides robust evidence that **social capital → reduced vulnerability → improved wellbeing** is the central mechanism of resilience in informal economies.

2. **Policy-Relevant Typologies**
    - The cluster analysis generated typologies of precarious, socially buffered, and economically secure markets, offering a comparative framework for WP7 synthesis.
3. **Policy Roadmap**
    - The Policy Matrix produced here is directly actionable, targeting municipal, national, and international stakeholders.

By sharpening the wellbeing framing, linking social capital to economic growth, and presenting results in a clear, evidence-punchy style, the Ghana case delivers precisely what Horizon reviewers expect: a rigorous, standalone contribution that advances the science and policy of resilience in Sub-Saharan Africa.

5.4 Final Reflections

This study began with a simple question: for whom is social capital important, and how can it be sustained? The Ghana evidence provides a compelling answer. Social capital is most important for the most vulnerable—widows, hawkers, and women without education—yet it is also most fragile for them. Sustaining it requires more than nurturing networks; it requires transforming the contexts of markets, governance, and environments so that networks can flourish.

The broader implication is that resilience in Sub-Saharan Africa is not a matter of heroic individuals, but of communities and contexts. Social capital is the invisible infrastructure of wellbeing, and its strengthening is as crucial for development as roads, schools, or hospitals.

References

Adger, W. N. (2003). Social capital, collective action, and adaptation to climate change. *Economic Geography, 79*(4), 387–404. https://doi.org/10.1111/j.1944-8287.2003.tb00220.x

Ansell, N., Hajdu, F., van Blerk, L., & Robson, E. (2019). Social capital and food security in sub-Saharan Africa. *World Development, 123*, 104593. https://doi.org/10.1016/j.worlddev.2019.104593

Aryeetey, E., & Steel, W. F. (1995). *Saving and credit associations in Ghana*. World Bank.

Between the state and the market. (2016). In *Being Middle Class in China* (pp. 49–67). Routledge. https://doi.org/10.4324/9781315643014-12

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood.

Chambers, R. (1989). Editorial introduction: Vulnerability, coping and policy. *IDS Bulletin, 20*(2), 1–7. https://doi.org/10.1111/j.1759-5436.1989.mp20002001.x

Chigbu, B. I., & Nekhwevha, F. (2023). Exploring the concepts of decent work through the lens of SDG 8: addressing challenges and inadequacies. *Frontiers in Sociology, 8*(November), 1–13. https://doi.org/10.3389/fsoc.2023.1266141

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*(Suppl), S95–S120. https://doi.org/10.1086/228943

Cope, M. R., Currit, A., Flaherty, J., & Brown, R. B. (2015). Making Sense of Community Action and Voluntary Participation—a multilevel test of multilevel hypotheses: Do communities act? *Rural Sociology, 81*(1), 3–34. https://doi.org/10.1111/ruso.12085

De Souza Briggs, X. (2020). *Democracy as problem solving: Civic capacity in communities across the globe*. MIT Press.

Desmond, M., & Gershenson, C. (2016). Housing and employment insecurity among the working poor. *Social Problems, 63*(1), 46–67. https://doi.org/10.1093/socpro/spv025

Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change, 16*(3), 253–267. https://doi.org/10.1016/j.gloenvcha.2006.04.002

Gehl, J. (2010). *Cities for people*. Island Press.

González-Quiñones, J. C., & Restrepo-Chavarriaga, G. (2010). Prevalencia de felicidad en ciclos vitales y relación con redes de apoyo en población colombiana. *Revista de Salud Pública, 12*(2), 228–238. https://doi.org/10.1590/s0124-00642010000200006

Gressel, C. M., Rashed, T., Maciuika, L. A., Sheshadri, S., Coley, C., Kongeseri, S., & Bhavani, R. R. (2020). Vulnerability mapping: A conceptual framework towards a

context-based approach to women's empowerment. *World Development Perspectives, 20*(July), 100245. https://doi.org/10.1016/j.wdp.2020.100245

Grootaert, C., & van Bastelaer, T. (2002). *Understanding and measuring social capital: A multidisciplinary tool for practitioners*. World Bank.

Gugerty, M. K. (2007). You can't save alone: Commitment in rotating savings and credit associations in Kenya. *Economic Development and Cultural Change, 55*(2), 251–282. https://doi.org/10.1086/508716

Helliwell, J. F., Layard, R., Sachs, J., & De Neve, J. E. (Eds.). (2023). *World Happiness Report 2023*. Sustainable Development Solutions Network.

Helliwell, J. F., & Putnam, R. D. (2004). The social context of well–being. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 359*(1449), 1435–1446. https://doi.org/10.1098/rstb.2004.1522

Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society B: Biological Sciences, 359*(1449), 1435–1446. https://doi.org/10.1098/rstb.2004.1522

Jiang, J., Qian, J., & Wen, Z. (2017). Social protection for the informal sector in urban China: Institutional constraints and self-selection behaviour. *Journal of Social Policy, 47*(2), 335–377. https://doi.org/10.1017/s0047279417000563

Kuran, C. H. A., Morsut, C., Kruke, B. I., Krüger, M., Segnestam, L., Orru, K., Nævestad, T. O., Airola, M., Keränen, J., Gabel, F., Hansson, S., & Torpan, S. (2020). Vulnerability and vulnerable groups from an intersectionality perspective. *International Journal of Disaster Risk Reduction, 50*(April). https://doi.org/10.1016/j.ijdrr.2020.101826

Lancee, B. (2010). The economic returns of immigrants' bonding and bridging social capital: The case of the Netherlands. *International Migration Review, 44*(1), 202–226. https://doi.org/10.1111/j.1747-7379.2009.00803.x

Medina, N., Abebe, Y. A., Sanchez, A., & Vojinovic, Z. (2020). Assessing Socioeconomic Vulnerability after a Hurricane: A Combined Use of an Index-Based approach and Principal Components Analysis. *Sustainability, 12*(4), 1452. https://doi.org/10.3390/su12041452

Montgomery, C. (2013). *Happy city: Transforming our lives through urban design*. Farrar, Straus and Giroux.

Morales, A. (2021). Public marketplaces promoting resilience and sustainability. *Sustainability, 13*(11), 6025. https://doi.org/10.3390/su13116025

Narayan, D. (1999). Bonds and bridges: Social capital and poverty. *World Bank Policy Research Working Paper, 2167*, 1–35.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology, 24*, 1–24. https://doi.org/10.1146/annurev.soc.24.1.1

Portes, A. (2014). Downsides of social capital. *Proceedings of the National Academy of Sciences, 111*(52), 18407–18408. https://doi.org/10.1073/pnas.1421888112

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.

Sabatini, F. (2008). Social capital and the quality of economic development. *Kyklos, 61*(3), 466–499. https://doi.org/10.1111/j.1467-6435.2008.00413.x

Sen, A. (1999). *Development as freedom*. Oxford University Press.

Sepadi, M. M., & Nkosi, V. (2022). Environmental and occupational health exposures and outcomes of informal street food vendors in South Africa: A quasi-systematic review. *International Journal of Environmental Research and Public Health, 19*(3), 1348. https://doi.org/10.3390/ijerph19031348

Toriro, P., & Chirisa, I. (2021). Vendors on wheels! The changing terrain and manifestation of informality in Harare under Covid-19 pandemic restrictions. *Cogent Social Sciences, 7*(1). https://doi.org/10.1080/23311886.2021.1939230

Woolcock, M. (2001). The place of social capital in understanding social and economic outcomes. *Canadian Journal of Policy Research, 2*(1), 11–17.

Xhafa, E., & Serrano, M. R. (2024). Workers in informal employment organising and acting collectively: The role of trade unions. 59.

Sub-appendix B5

A 1: **Sampling and Sample Size**

Target Population

The target population for this study comprised female street vendors and hawkers in the Greater Kumasi Metropolitan Area (GKMA). This group included women operating from fixed stalls, those engaged as mobile hawkers, and those adopting hybrid vending strategies that combined both modes of operation. The deliberate exclusion of male vendors was motivated by the study's emphasis on gender-specific vulnerabilities within the informal economy. Prior literature demonstrates that women in street-based livelihoods experience a disproportionate burden of structural constraints, including childcare responsibilities, limited access to credit, restricted mobility, and reduced bargaining power in market negotiations (Chigbu & Nekhwevha, 2023; Jiang et al., 2017). Thus, focusing exclusively on women provided a sharper analytical lens to interrogate the nexus between street vending, resilience, and well-being in the GKMA context.

Sampling Frame and Technique

Given the absence of an official or comprehensive registry of street vendors in Ghana, the sampling frame was constructed using a two-step procedure: (i) observational mapping of vending clusters across the metropolis, and (ii) liaison with local market associations, trade leaders, and assembly officials for vendor listings and contextual guidance. This hybrid approach ensured adequate coverage of both formal and informal trading spaces.

To ensure spatial representativeness, the sampling frame was anchored around all eight Metropolitan, Municipal and District Assemblies (MMDAs) that constitute the GKMA, namely: Kumasi Metropolitan, Asokwa, Oforikrom, Suame, Tafo, Kwadaso, Old Tafo, and Asokore Mampong. Within each MMDA, major trading hubs and vending corridors were identified, spanning both central business districts (e.g., Kejetia Market under KMA) and peripheral market centers (e.g., Atonsu under Asokwa, Suame Roundabout enclave, and Tafo Market).

A **multistage sampling strategy** was employed as follows:

- **Stage One – MMDA Selection:** Stratified purposive sampling ensured that all eight MMDAs in GKMA were included, reflecting both high-density metropolitan zones and less congested peripheral municipalities.
- **Stage Two – Market/Vendor Identification:** Within each MMDA, **systematic random sampling** was applied along pre-defined transects in markets, street corridors, and transport terminals. Enumerators selected every *nth* vendor encountered until the quota target for that MMDA was achieved.
- **Stage Three – Participant Inclusion:** Eligibility criteria required respondents to:

    1. Be **female and aged 18 years or above**,
    2. Have been engaged in vending or hawking for at least **six months prior to the survey**,
    3. Provide informed consent to participate.

This framework ensured comprehensive coverage of the GKMA, capturing vendors' realities across spatial, demographic, and economic divides.

Sample Size Determination

The sample size was determined using **Cochran's (1977) formula** for large populations, adjusted for operational realities:

$$n_0 = \frac{Z^2 \cdot p(1-p)}{e^2}$$

Where:

- Z = 1.96 for 95% confidence level,
- p = 0.5 (assumed proportion to maximize sample size),
- e = 0.05 (margin of error).

$$n_0 = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384.16$$

Thus, a **minimum of 384 respondents** was required. To strengthen statistical power, allow subgroup analysis across the 8 MMDAs, and account for non-response, the figure was **inflated by ~80%**:

$$n = 384 \times 1.8 \approx 700$$

Accordingly, **700 female vendors** were surveyed.

Justification for Proportional Allocation Across MMDAs

The allocation of the total sample (N=700) across the eight GKMA MMDAs followed a probability-proportional-to-size (PPS) logic to (i) minimize variance in MMDA-level estimates, (ii) reflect the true distribution of vending intensity, and (iii) preserve sufficient cell sizes for subgroup analysis (e.g., activity type, age cohort, mobility). Three observable proxies informed "size":

1. **Vendor Density** (D_m): relative concentration of vendors observed per standardized transect length during the mapping exercise.
2. **Market Footfall/Throughput** (F_m): average shopper flows and transport terminal adjacency (proxied via enumerator tallies at peak and off-peak windows).
3. **Market Node Importance** (I_m): nodal centrality within the urban trading network (e.g., CBD vs. peripheral nodes; multi-route transport interchanges; commodity diversity).

These proxies correlate with the likelihood of encountering vendors and the volume/diversity of trading, thereby giving each MMDA a weight that mirrors operational realities rather than administrative size alone.

Allocation Rule and Formula

For $m \in \{1, \ldots, 8\}$, define a composite weight:

$$W_m = \alpha \cdot \widetilde{D_m} + \beta \cdot \widetilde{F_m} + \gamma \cdot \widetilde{I_m}, \quad \alpha + \beta + \gamma = 1,$$

where $\widetilde{D_m}, \widetilde{F_m}, \widetilde{I_m} \in [0,1]$ are min–max normalized scores derived from field tallies and mapping sheets. In this study, α=0.5 (density given primacy), β=0.3 (footfall), and γ=0.2 (node importance).

The MMDA quota is then:

$$n_m = \max\left\{n_{\min}, \text{round}\left(N \cdot \frac{W_m}{\sum_{j=1}^{8} W_j}\right)\right\}$$

a **minimum cell size** n_{min} to 50 to ensure estimability of MMDA-level parameters and interaction terms. Post-rounding reconciliation ensures $\sum_m n_m = 700$

Why Larger Quotas for KMA (and Other Core MMDAs)?

- **Higher D_m and F_m:** The CBD (e.g., Kejetia) and contiguous corridors exhibit markedly higher vendor counts per transect and larger, more stable footfall, inflating W_m.
- **Functional Centrality (I_m):** Central markets interface multiple transport routes and commodity exchanges, increasing vendor heterogeneity and analytical value (e.g., comparing fixed vs. mobile vs. hybrid strategies).
- **Analytical Necessity:** Larger core quotas improve **precision** for (a) comparisons by location typology (CBD vs. peripheral), (b) income dispersion analyses, and (c) exposure to policing/relocation policies.

By contrast, **Old Tafo** and **Asokore Mampong** exhibit lower observed density and fewer high-throughput nodes, warranting smaller—but still adequate—quotas (50 each) that satisfy minimum precision requirements and ethical representation.

Precision and Power Considerations

i. The PPS design reduces **design effects** associated with clustering around high-density corridors by aligning sample shares with true vendor distributions.

ii. With $n_{min} = 50$r MMDA, 2–3 key binary contrasts (e.g., mobile vs. fixed; childcare burden high vs. low) maintain acceptable power at α=0.05, especially when pooled in multivariate models with MMDA fixed effects.

iii. The overall N=700 sustains **subgroup analysis** without inflating Type I error, given model-based adjustments (e.g., robust or cluster-robust SEs at transect or MMDA level).

Appendix C

Supplementary information A

Country Name	Western Countries
Angola	Austria
Benin	Australia
Botswana	Belgium
Burkina Faso	Bulgaria
Burundi	Canada
Cameroon	Croatia
Central African Republic	Cyprus
Chad	Czechia (Czech Republic)
Comoros	Denmark
Congo Brazzaville	Estonia
Congo Kinshasa	Finland
Eswatini	France
Ethiopia	Germany
Gabon	Greece
Gambia	Hungary
Ghana	Ireland
Guinea	Italy
Ivory Coast	Latvia
Kenya	Lithuania
Lesotho	Luxembourg
Liberia	Malta
Madagascar	Netherlands
Malawi	New Zealand
Mali	Poland
Mauritania	Portugal
Mauritius	Romania
Mozambique	Slovakia
Namibia	Slovenia
Niger	Spain
Nigeria	Sweden
Rwanda	United States
Senegal	
Sierra Leone	
Somalia	
Somaliland	
South Africa	
South Sudan	
Sudan	

Tanzania	
Togo	
Uganda	
Zambia	
Zimbabwe	

Supplementary information B

Table B1: List of features

Feature	Description
Safety	Do you feel safe walking alone at night in the city or area where you live?
Negative Experience Index	The index is compiled using the following questions: Did you experience the following feelings during a lot of the day yesterday? How about physical pain? How about worry? How about sadness? How about stress? How about anger?
Optimism Index	Index compiled using the following questions: i) Right now, do you feel your standard of living is getting better or getting worse? ii) Right now, do you think that economic conditions in the city or area where you live, as a whole, are getting better or getting worse? iii) Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. Just your best guess, on which step do you think you will stand in the future, say about five years from now?
Youth Development Index	Index compiled using i) In the city or area where you live, are you satisfied or dissatisfied with the educational system or the schools? ii) Do you believe that children in (country) are treated with respect and dignity, or not? iii) Do most children in (country) have the opportunity to learn and grow every day, or not?
Health	Do you have any health problems that prevent you from doing any of the things people your age normally can do?
Social Life Index	Index compiled using the questions: i) If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not? ii) In the city or area where you live, are you satisfied or dissatisfied with the opportunities to meet people and make friends?
Satisfaction with the place where you live	Index compiled using i) Are you satisfied or dissatisfied with the city or area where you live? ii) In the next 12 months, are you likely or unlikely to move away from the city or area where you live? iii) Would you recommend the city or area where you live to a friend or associate as a place to live, or not?
National Institutions Index (trust	Index compiled using the following four questions: i) Do you have confidence in each of the following, or not? How about the military?

in institutions)	ii) How about the judicial system and courts? iii) How about the national government? iv) How about the honesty of elections?
Corruption Index	Index compiled using i) Is corruption widespread within businesses located in (country), or not? ii) Is corruption widespread throughout the government in (country), or not?
Employment status	Six categories: employed full time for an employer, employed full time for self, employed part time (do not want to work full time), employed part time (want to work full time), unemployed and out of the workforce. Recoded to a binary – employed or not employed.
Income	Measured using per capita income quintiles. Additionally, we included income per capita (constant US$) as a continuous variable.
Civic Engagement Index	Index compiled using: Have you done any of the following in the past month? i) How about donated money to a charity? ii) How about volunteered your time to an organisation? iii) How about helped a stranger or someone you didn't know who needed help?
Age	Years
Migrant status	Based on the question: Were you born in this country, or not?
Religion status	Determined by the question: Could you tell me what your religion is? – 29 possible religions. Recoded as Christian, Islam, Other and non-believers.
Education	Measured by the highest completed level of education
Food and Shelter Index	Index compiled using the following two questions: i) Have there been times in the past 12 months when you did not have enough money to buy food that you or your family needed? ii) Have there been times in the past 12 months when you did not have enough money to provide adequate shelter or housing for you and your family?
Freedom	Measure by the question: In (this country), are you satisfied or dissatisfied with your freedom to choose what you do with your life?
Country name	39 SSA countries and 31 Western countries, including 27 from the European Union, North America, New Zealand and Australia

Figure B1: PA-LE balance prevalence by region (2024)

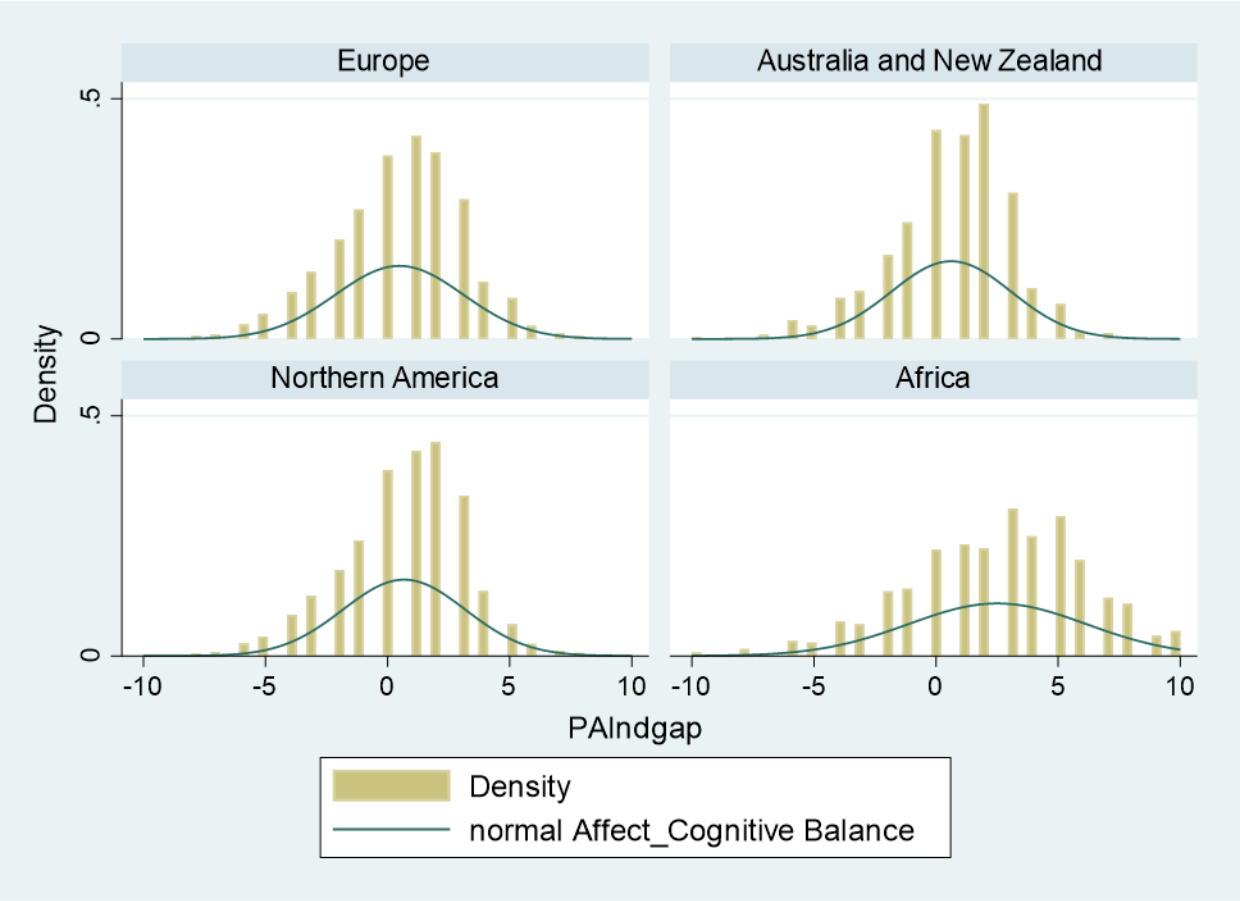
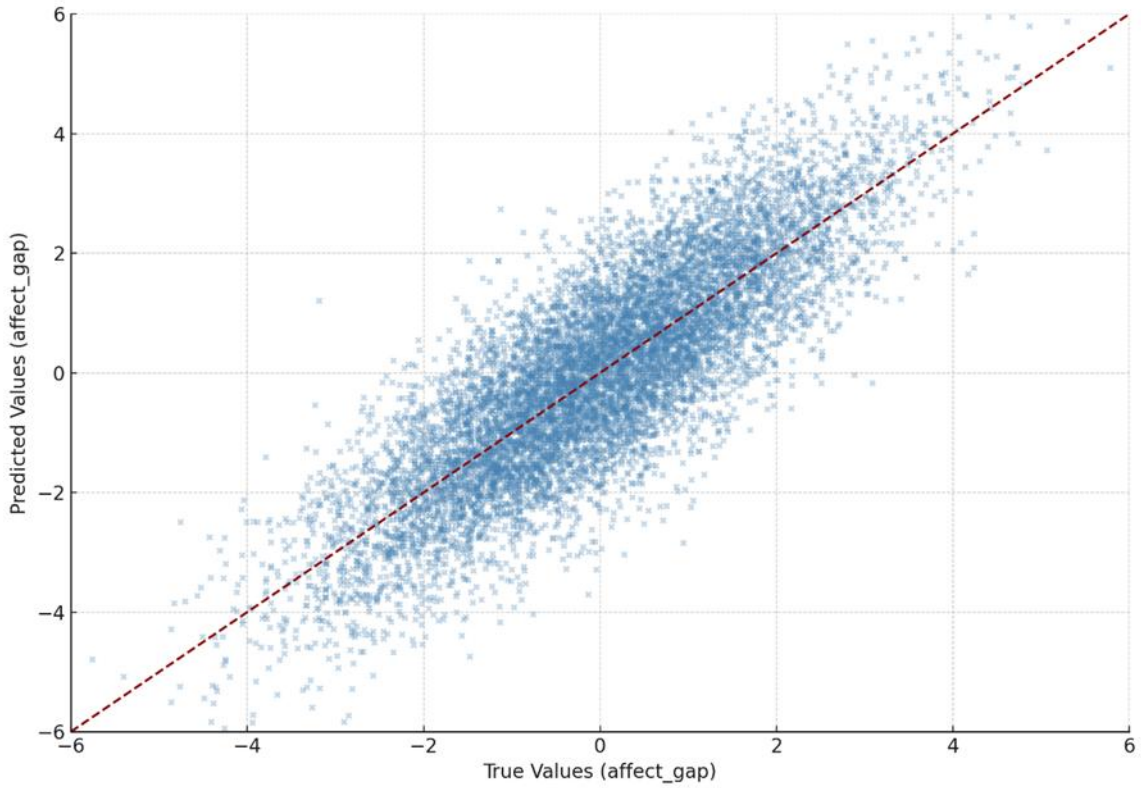


Figure B2. XGBoost: predicted PA-LE balance values plotted against the true values.



Supplementary information C

Figure C1. SHAP dependence plot; health problems - SSA

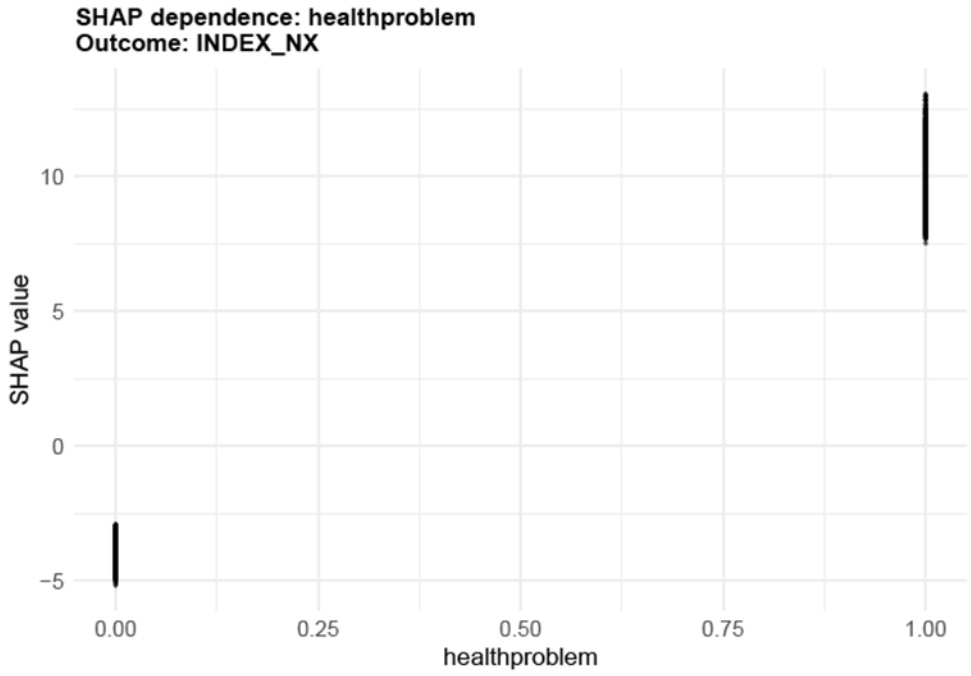


Figure C2. SHAP dependence plot; food and shelter – SSA

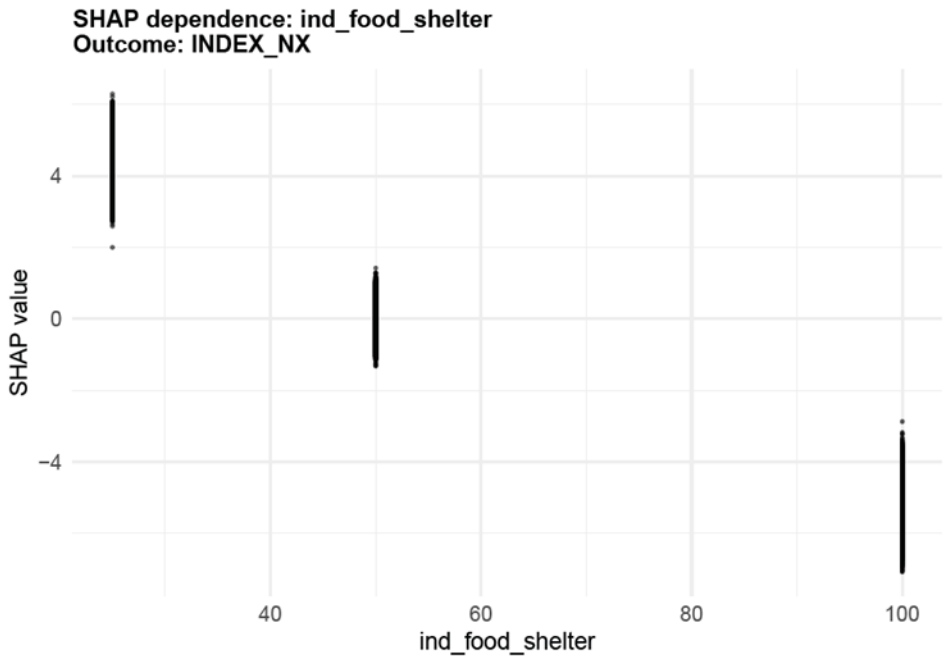


Figure C3. SHAP dependence plot; satisfaction with place - SSA

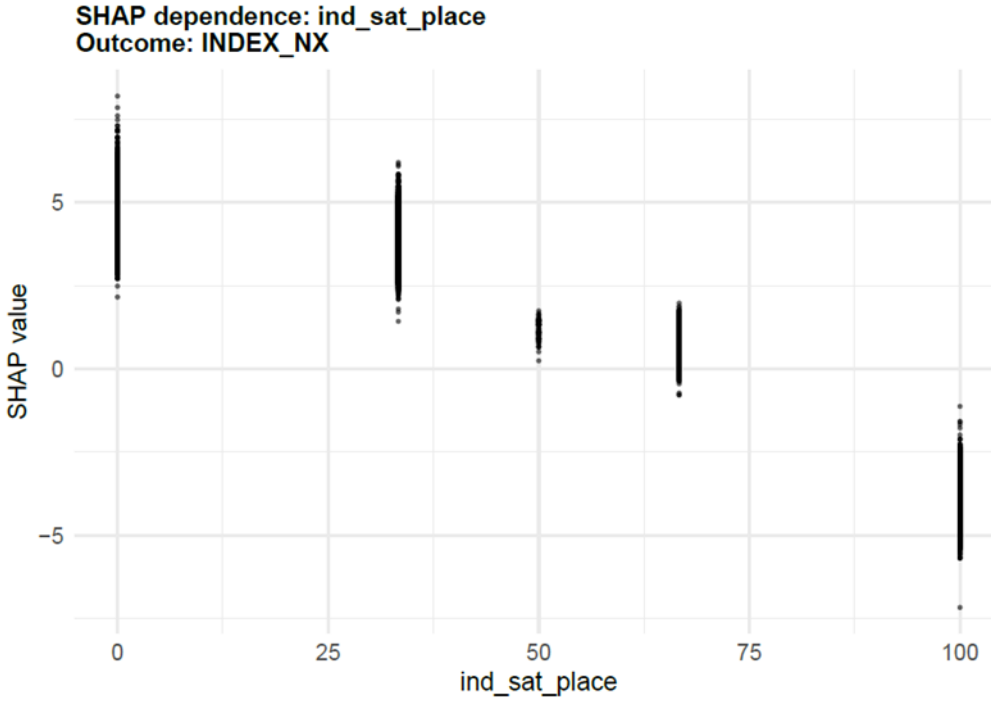


Figure C4. SHAP dependence plot; income – SSA

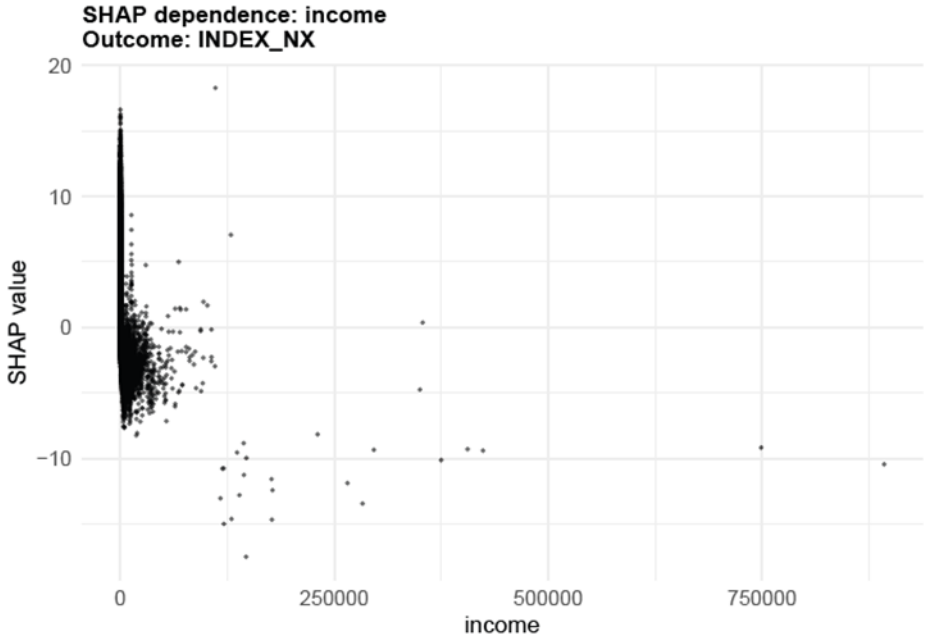


Figure C5. SHAP dependence plot; social life - SSA

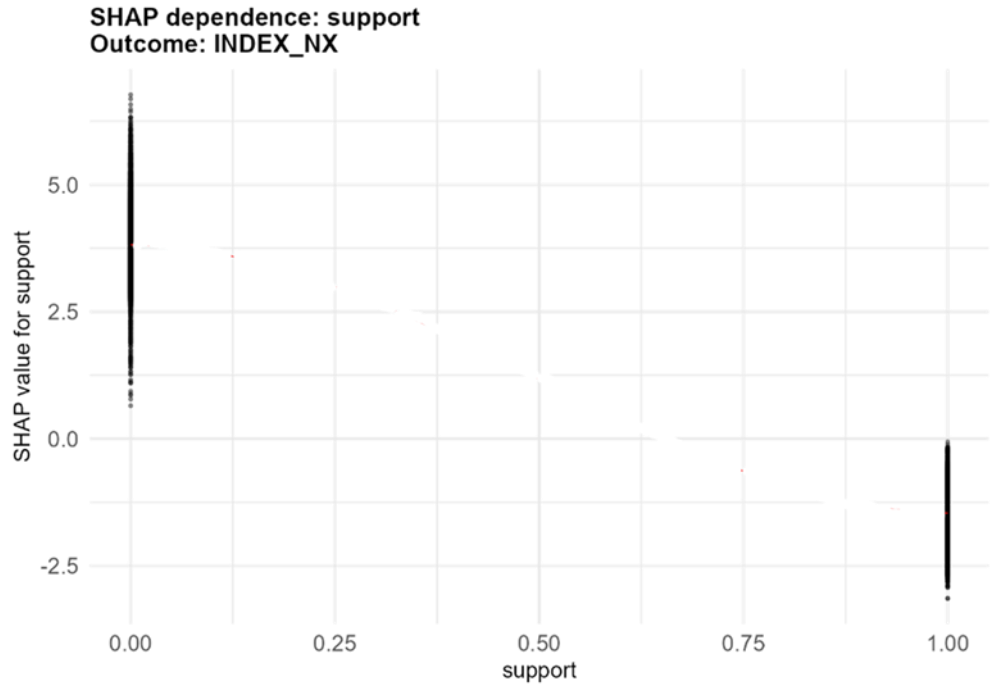


Figure C6. SHAP dependence plot; education - SSA

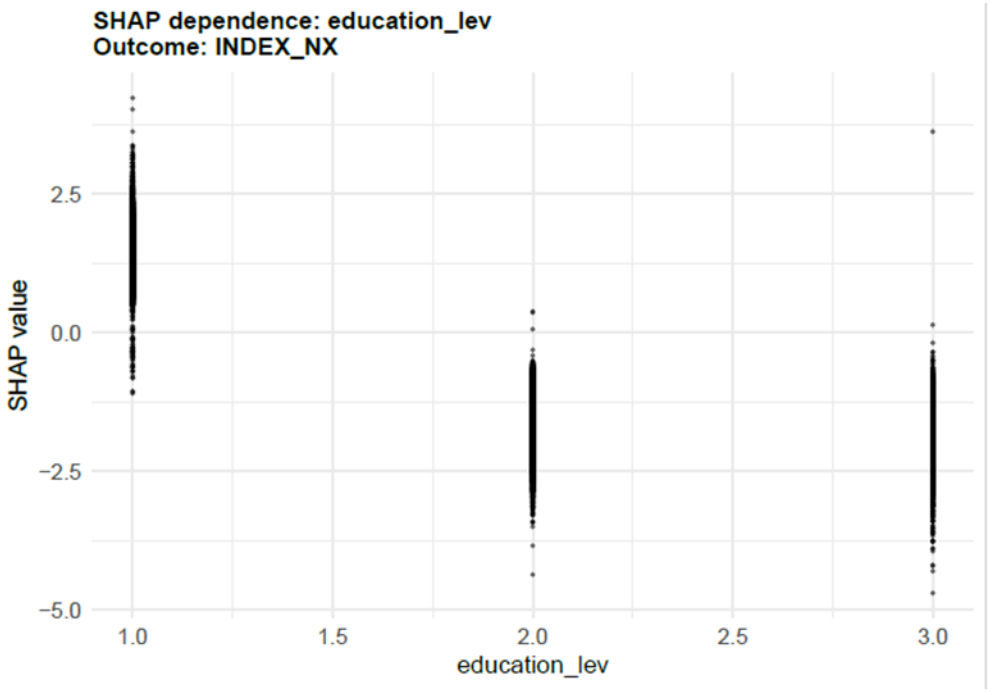


Figure C7. SHAP dependence plot; health problems – Europe

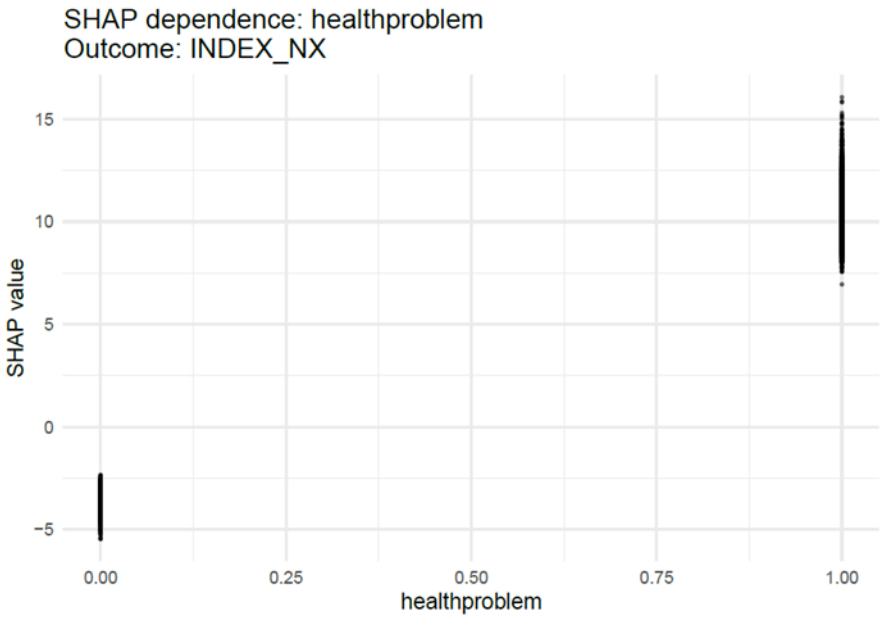


Figure C8. SHAP dependence plot; food and shelter - Europe

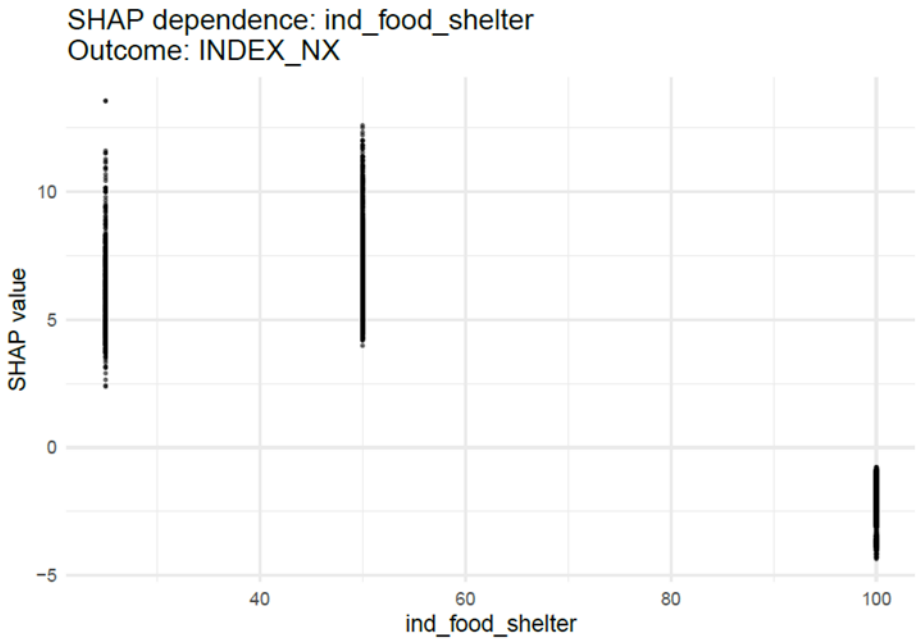


Figure C9. SHAP dependence plot; freedom - Europe

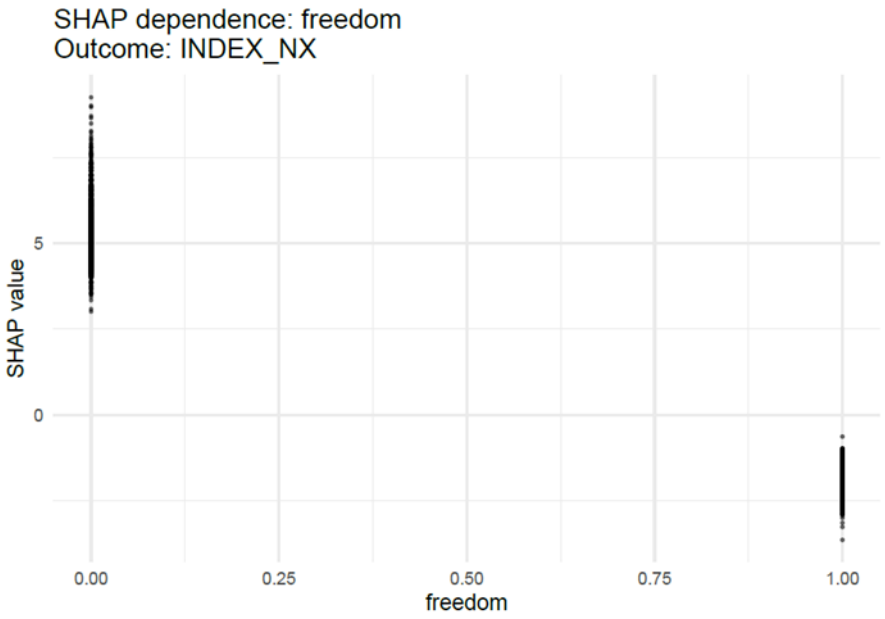


Figure C10. SHAP dependence plot; civic engagement – Europe

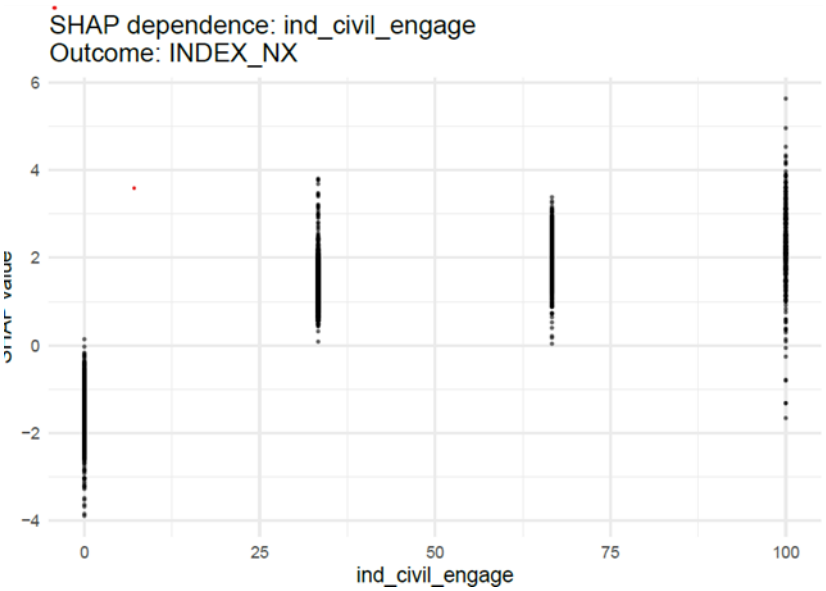


Figure C11. SHAP dependence plot; age - Europe

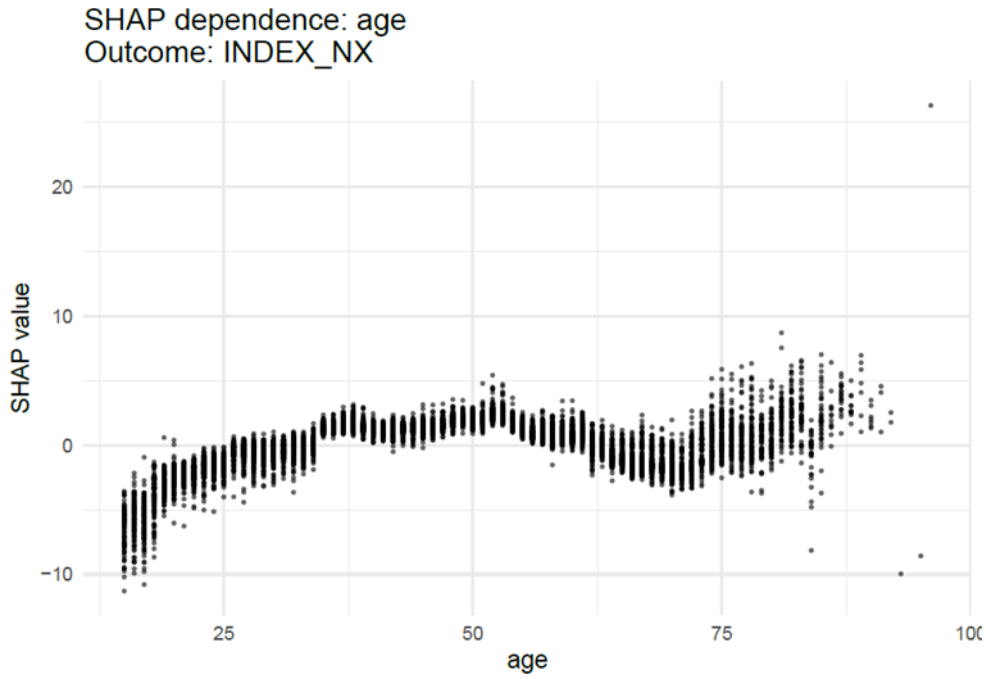
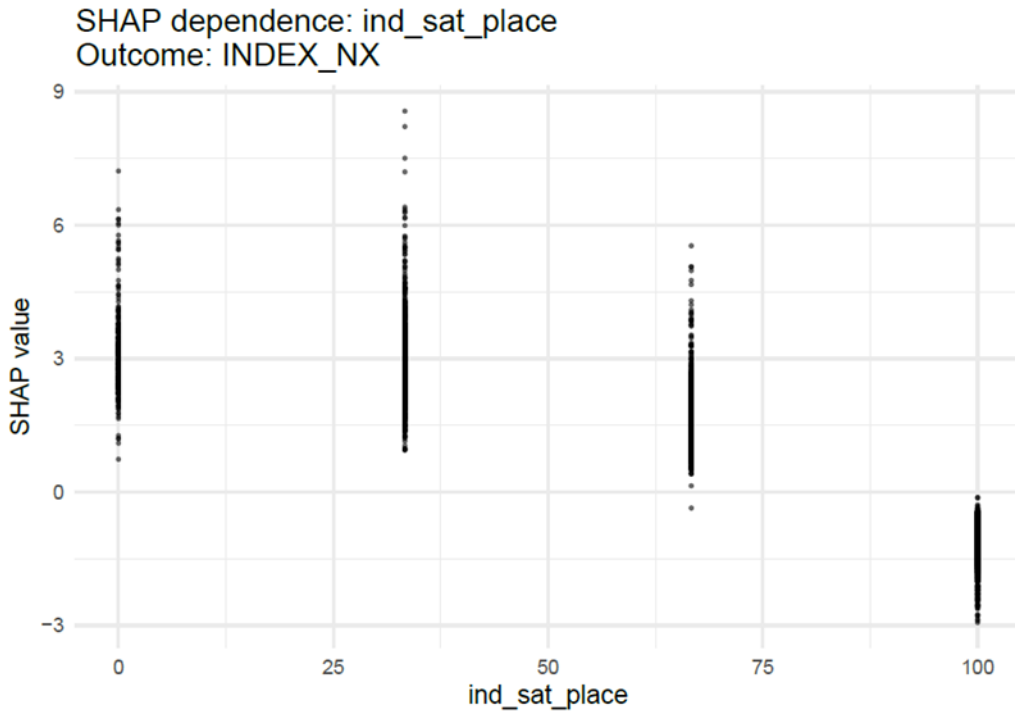


Figure C12. SHAP dependence plot; satisfaction with place – Europe



Supplementary information D

Model Evaluation

Model evaluation uses metrics to analyse the model's performance and, thus, how well the model generalises future predictions. One can use many metrics, including Accuracy, Precision, Recall, F1 score, Confusion Matrix, and various error calculations such as the Root Mean Square Error.

The first group applies to classification models and models in which the predicted outcome variable is discrete (or binary). However, our dependent variable (predicted variable) is a continuous variable. To evaluate the performance of the models, we consider different error calculation measures as they summarise how close the prediction is to the actual value.

We consider the Mean Absolute Error (MAE), the Mean Squared Error (MSE), and the Root Mean Square Error (RMSE).

Mean squared error

The mean squared error (MSE) evaluates the proximity of a regression line to a group of data points. It is a risk function that corresponds to the predicted squared error loss value. MSE is computed by calculating the average of the squared mistakes resulting from a function's data, especially the mean. From equation (1), we see that the MSE is calculated by taking the observed value (y_i), subtracting the expected value ($\hat{y}_i$), and then squaring. Repeat for every observation. Afterwards, divide the total by the total number of occurrences (n) by the sum of the squares of the values.

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2 \quad (1)$$

Therefore, the MSE measures the error in prediction algorithms. This statistic quantifies the average squared variance between observed and predicted values. Squaring the differences removes negative mean squared error differences and ensures that the squared mean error is always non-negative, i.e., it is always larger than or equal to zero. The value is usually always positive. When there are no errors in a model, the MSE equals 0.

Moreover, squaring magnifies the effect of greater inaccuracies. These computations punish greater mistakes disproportionately more than smaller ones, i.e., a model's worth increases proportionally to its degree of error. This attribute is necessary if we want our model's mistakes to be fewer.

The MSE in regression, for instance, might indicate the average squared residual. The MSE decreases as the data points align with the regression line, indicating a reduction in model error. A model with fewer errors yields more accurate predictions.

If the MSE is high, the data points are spread out quite a bit from the centre moment, while a low value implies the opposite. When the data points cluster tightly around their mean, the MSE will be modest (mean). It indicates that our data values are distributed normally, with no skewness, and, most importantly, that there are fewer errors, where errors are defined as the distance between our data points and the mean.

Mean absolute error

In the context of machine learning, absolute error refers to the magnitude of the difference between the predicted value of an observation and its true value. Mean absolute error (MAE) takes the average of absolute errors for a group of predictions and observations to measure the magnitude of errors for the entire group.

As one of the most commonly used loss functions for regression problems, MAE (equation 2) helps formulate learning problems into optimisation problems. It also serves as a straightforward, quantifiable measure of errors for regression problems.

$$MAE = \frac{1}{n}\sum_{i=1}^{n}|y_i - \hat{y}_i| \quad (2)$$

Root mean square error

The Root Mean Square Error (RMSE) represents the square root of the average squared differences between predicted and observed outcomes. It is a metric predominantly utilised in regression analysis and forecasting, where accuracy matters significantly. The lower the RMSE, the more accurately the model predicts. Conversely, a higher RMSE signifies a greater discrepancy between the predicted and actual outcomes. RMSE initially computes the difference between each data point's observed and predicted value. This difference, known as the residual, is squared. The squared residuals are then summed to obtain a cumulative figure, which is divided by the number of data points to yield the MSE. Finally, the square root of the MSE is calculated, resulting in the RMSE (see equation 3).

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2} \quad (3)$$

Where y_j is the true value of the dependent variable (PA-LE balance), $\hat{y}_j$ is the predicted value of the dependent variable (PA-LE balance), and n is the number of observations.