Original Research Paper

Measuring Refugee's and Host Community Vulnerability to Idiosyncratic and Covariate Causes of Poverty Shocks in Uganda

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Abstract: The analysis reveals diverse patterns of change in poverty levels and inequality dynamics within different settlements. This study specifically provides insights into the impact of idiosyncratic and covariate poverty shocks on poverty and inequality across various refugee and host community settlements in Uganda. The data shows that in Bidi Bidi Settlement, poverty decreased by 1.7 units while inequality increased by 3.8 units. Similarly, in the Imvepi refugee settlement, poverty decreased by 3.1 units, but inequality increased by 4.5 units. In Kampala Urban settlement, there was a decrease in poverty by 1.1 units and a slight increase in inequality by 0.2 units. Kyaka II settlement experienced a small increase in poverty by 0.2 units and an increase in inequality by 2.1 units. Kyangwali settlement saw a significant increase in poverty by 6.7 units and an increase in inequality by 3.7 units. Conversely, rhino settlement experienced a significant decrease in poverty by 11.1 units, but inequality still rose by 3.1 units. In the Rwamwanja settlement, poverty decreased by 1.6 units while inequality increased by 3.4 units. Additional metrics indicate minor variations in poverty and inequality across these settlements, such as minor increases in poverty and decreases in inequality, suggesting that poverty shocks have disproportionately affected certain groups. This comprehensive analysis illustrates the nuanced and varied impact of poverty shocks on different communities, highlighting the complexity of addressing poverty and inequality simultaneously. It underscores the need for tailored interventions that consider both the reduction of poverty and the mitigation of inequality, ensuring that efforts to alleviate economic distress do not inadvertently widen the gap between different population groups.

Keywords: Refugee's Host Community, Vulnerability, Idiosyncratic, Covariate, Poverty, Shocks, Uganda Background and Contextual Environment

Introduction

The number of forcibly displaced persons recognized by the United Nations (UN) has since the 1950s, significantly increased from over 2.1 m international refugees in 1951 to nearly 108 m displaced individuals in 2022. These annual figures reflect the number of individuals identified by the UN rather than the actual number of forcibly displaced persons globally (OPM and UNHCR, 2023). Preliminary data for 2023 suggests that this number might reach 110 m, with significant new crises in Sudan and Palestine adding to the increase caused by the Russia-Ukraine conflict in 2022, which first pushed the figure past 100 m (UNHCR *et al*., 2022). The plight of refugees globally remains a critical humanitarian issue,

with millions forced to leave their homes due to conflict, persecution, or environmental disasters (OPM and UNHCR, 2023). According to the United Nations High Commissioner for Refugees (UNHCR) 2018 report, there were around 68.5 m forcibly displaced individuals in 2017, including 25.4 m refugees (those living outside their home country), 3.1 m asylum seekers (pending cases) and 40 m internally displaced persons (OPM and UNHCR, 2023). Of these, 85% resided in developing countries, with about one-third in the least developed countries (OPM and UNHCR, 2023).

In terms of global distribution, Africa hosted about 34% of all displaced individuals (UNHCR *et al*., 2022). In 2017, the refugee population in Sub-Saharan Africa (SSA) increased by 22%, primarily due to the crisis in

South Sudan (Schulte and Kasirye, 2019). High-income countries tend to host fewer refugees, making the negative impacts more manageable (NRC, 2023). Conversely, developing nations often host a larger number of refugees relative to their populations but receive substantial external financial and technical support (Kreibaum, 2016). This support is frequently channeled through international agencies and organizations like UNHCR, providing social and economic assistance to forcibly displaced individuals (Biira, 2016). This international support not only alleviates potential fiscal burdens on host countries but also stimulates local economies by increasing the demand for locally produced goods and services. Drawing from empirical evidence and studies conducted by various scholars, the plight of refugees and displaced persons cannot be overstated (UNDP, 2017). The global refugee crisis has led to unprecedented levels of displacement, with millions seeking refuge across international borders or becoming internally displaced within their own countries (GoU, 2023).

According to the 2023 UNHCR report, the number of forcibly displaced individuals worldwide surpassed 80 m by the end of 2020, marking a significant increase over the past decade (GoU, 2023). This crisis is driven by numerous factors, including armed conflicts, human rights abuses, political instability, environmental degradation, and socio-economic disparities (Schulte and Kasirye, 2019). Sub-Saharan Africa, for example, is one of the regions most affected by forced displacement, hosting a substantial portion of the global refugee population (Omata and Kaplan, 2013). Countries like Uganda, Kenya, Ethiopia, and Tanzania face protracted conflicts, fragile governance structures, and environmental challenges, exacerbating the vulnerability of refugee populations (Omata and Kaplan, 2013). The ongoing hostilities in Sudan, South Sudan (SS), Somalia, and the Democratic Republic of Congo (DRC) continue to result in large refugee flows, which thus puts additional strain on the government and development partners to provide alternative ways of alleviating poverty and vulnerabilities, as well as host communities' resources such as land and other resources (ILO, 2023).

Data indicates that Uganda has become the third largest refugee-hosting country globally, after Turkey and Pakistan, with over one million refugees over the past three and a half decades (Khosla and Jena, 2020). By June 2018, Uganda was believed to have hosted approximately 1.36 m refugees (United Nations Development Programme, 2009; UNICEF, 2019). The primary drivers of this significant displacement include civil wars, violent conflicts, and socio-economic and political persecution in the Horn of Africa and the Great Lakes Region (GLR). In 2018 alone, 985,512 refugees from South Sudan, 271,967 from the Democratic Republic of Congo (DRC), and 36,677 from Burundi entered Uganda (UBOS, 2019; UNICEF, 2019).

According to figures from the prime minister's office, 70,988 immigrants from Ethiopia, Eritrea, Rwanda, Somalia, and Sudan have sought asylum in Uganda during the preceding three and a half decades (OPM and UNHCR, 2023; Laurent, 2022). More than 60% of Uganda's refugees are under the age of 18, reflecting the impact of regional conflicts on children and the implications for protection services (OPM and UNHCR, 2023; Laurent, 2022). Refugees are dispersed across the country, primarily in the Western, Central, Northern, and West Nile sub-regions (ILO, 2023). Ninety-two (92%) are currently in settlement camps alongside the native people notably in Kampala's central administrative area, which is home to just eight (8%) of the refugee population (Weiwei *et al.*, 2020). Kampala hosts a significant number of refugees, with around 140,000 from the DRC, 70,000 from South Sudan, and 7,000 from Burundi (REACH, 2019).

The East African area provides a one-of-a-kind case study in refugee protection and host community administration (Baseler *et al.*, 2013). Except for Tanzania, almost all other East African nations have endured violent wars that have compelled millions of their residents to flee as refugees or seek asylum. Some nations in the area have also played important roles in sheltering refugees from the Horn of Africa (United Nations Development Programme, 2009). For example, Rwanda's 1959 civil war and the 1994 Genocide prompted millions of Rwandans to escape to neighboring countries, namely Uganda and Tanzania. The post-election violence in Kenya in 2007 prompted many people to flee to Uganda, Tanzania, and Ethiopia (Khosla and Jena, 2020; Loiacono and Silva Vargas, 2019).

The LRA insurgency in Northern and Eastern Uganda led to massive displacement, while ongoing conflicts in South Sudan and the DRC have created one of the world's worst contemporary humanitarian crises (Lawson, 2000). Uganda has gained recognition for its progressive refugee policies, allowing refugees to use land for cultivation and access essential social protection services like healthcare and education (GoU, 2010). Despite these efforts, refugees in Uganda face numerous challenges, including limited economic opportunities, inadequate infrastructure, and vulnerability to poverty shocks (OPM and UNHCR, 2023). The review of available statistical analyses reveals the need for socio-economic interventions to support refugees and host community coping mechanisms.

In this context, measuring refugee vulnerability to idiosyncratic and covariate causes of poverty shocks becomes imperative (Clements *et al.*, 2016; Simon, 2016). This study decomposes idiosyncratic shocks such as illness, job loss due to forced displacement, and crop failure due to several occurring factors, which can have a significant impact on individual households, while covariate shock measurements cover events such as natural disasters (floods and landslides), economic downturns that affect the entire population in a given

community or regions simultaneously (Schneiderheinze and Lücke, 2020). Therefore, idiosyncratic and covariate shocks have statistically been analyzed by identifying the prevalence and impact of these shocks on both refugee and host community populations to generate and inform targeted interventions that build resilience and enhance the overall livelihoods of the population affected (Verme and Schuettler, 2021). Therefore, understanding the dynamics of refugee populations, their vulnerabilities and their resilience to various challenges is essential for effective policy-making and humanitarian assistance (Baseler *et al.*, 2013).

Problem Statement

Although Uganda has consistently earned global praise from various multilateral and bilateral agencies, including but not limited to the United Nations (UN) due to its progressive policy on refugees, the question of refugee settlements and host communities face significant challenges, including economic shocks that have been seen to exacerbate poverty levels among the vulnerable populations. The literature gap in understanding how these shocks impact poverty and vulnerability levels among refugees and host communities, particularly concerning household characteristics such as size, is crucial for designing effective interventions to mitigate their adverse effects and promote sustainable development.

Despite efforts to address poverty and vulnerability within refugee settlements and host communities, there remains a gap in knowledge regarding the differential impact of shocks on poverty levels based on household size. Limited research has explored how household size influences vulnerability to shocks and coping mechanisms employed by refugees and households hosting refugees within these contexts. Thus, the study aims to examine how the impact of shocks on poverty levels varies based on household size among refugees and host communities across different settlements. By analyzing the ratios calculated for different settlements and linking them to household size data, the paper sheds light on the differential vulnerabilities and coping mechanisms associated with varying household sizes.

Aim

This study aims to generate new insights for addressing the knowledge policy gap by providing evidence-based policies and interventions that promote resilience, reduce poverty and vulnerability, and improve the well-being of vulnerable populations in refugee settlements and host communities. Specifically, the first aim is contextualized in understanding the knowledge gap due to the lack of comprehensive data regarding how household size influences the impact of shocks on poverty levels among refugees and host communities within different settlements. The second gap is mirrored towards

policy implications, which without a clear understanding of how household size interacts with the impact of shocks on poverty and vulnerability levels, policymakers may struggle to design targeted interventions that effectively address the specific needs of households with different sizes within refugee settlements and host communities.

Objective

1. To measure how poverty rates, change across various household sizes within refugee settlements and host communities
2. To establish and understand how household size influences the coping mechanisms employed by refugees and host communities in response to shocks
3. To generate and provide policymakers and stakeholders with policy options in designing targeted interventions to address the specific needs of households of different sizes within refugee settlements and host communities

Materials and Methods

This study utilized a combination of econometric analysis and comparative analysis to achieve the objectives. The first step was to incorporate household size data into an econometric model that examines the impact of shocks on poverty levels among refugees and host communities across different settlements. Through the analysis of the coefficients and interaction terms in the model, the researcher was able to assess how household size moderates the effect of shocks on poverty levels. In the second step, the researcher conducted a comparative analysis to examine how the ratios of poverty increase vary across households of varying sizes within each settlement. This comparative analysis provided insights into the differential vulnerabilities and coping mechanisms associated with different household sizes, contributing to a comprehensive understanding of the impact of shocks on poverty levels among refugees and host communities. The third step in the methodology provided valuable insights into the complex dynamics of poverty and vulnerability among refugees and host communities, with a specific focus on the influence of household size. By addressing these issues, this study aimed to contribute to the development of evidence-based policies and interventions that promote resilience, reduce poverty, and improve the well-being of vulnerable populations in refugee settlements and host communities.

Data Sources and Analysis

The Uganda Bureau of Statistics (UBOS) conducted the 2019/20 Uganda National Household Survey (UNHS), aiming to collect data on the demographic, social, and economic characteristics of households

(UBOS, 2019). A two-stage stratified sampling approach was used, with 1651 Enumeration Areas covered and 16,510 households expected to be surveyed. A national response rate of 83% was achieved. The Pearson correlation was employed in the study's inferential analysis to determine the degree of relationship between agriculture and food security of refugees and host community populations. A total of 6 refugee settlement camps and 6 host communities areas data on respondents was obtained from the Ministry of Disaster and Refugees (MDR) in the Office of the Prime Minister (OPM) of Uganda for refugee data and host communities' population from the Uganda Bureau of Statistics *j*. Out of the eleven main refugee settlement camps across the country, six refugee settlement camps were purposively selected for the analysis. Three different models are used to estimate each of the following refugees and host community participation in agriculture as their main source of income and employment, food and income security, and consumption expenditure per capita by establishing if there is relationship between refugees and host communities, how refugees and host community population participate in agricultural, what other activities used to better and improved their welfare. Appleton and Ssewanyana (2003) study on the welfare aggregate in northern regions uses a survey to gather detailed expenditure data at the household level (Appleton and Ssewanyana, 2003; Verme and Schuettler, 2021). The aggregate is adjusted for price variations and household composition. The survey reveals comprehensive expenditure data item by item during a 30-day recall period. The household spending habits are then aggregated to create a social assistance composite. Food produced and consumed at home is priced according to market values and added to this total. The welfare aggregate is adjusted for price fluctuations over time and space, as well as family sex and age composition. The study also includes information on community characteristics, access to services, and client satisfaction with education, health, water, and sanitation (Appleton and Ssewanyana, 2003; Verme and Schuettler, 2021).

The Estimation Strategy of Vulnerability as Expected Poverty (VEP)

Assessing vulnerability to poverty involves estimating the likelihood of a household experiencing poverty or shocks that reduce welfare below a socially accepted level (Christiaensen and Subbarao, 2005). Ideally, this requires information on the mean and variance of household welfare collected from repeated observations over time. However, few countries, particularly in the developing world, have panel data tracking the same households for extended periods. Consequently, this study uses cross-sectional data to estimate vulnerability, following the methodology of Günther and Harttgend (2009). This method differentiates unexplained variance at the household level (idiosyncratic shocks) from community-level variance (covariate shocks), correcting for inefficiencies that may arise in hierarchical data (Vittori and C, 2008). The main hypothesis is that unexplained variance in household consumption captures the impact of both household-specific and community-specific shocks, which can be explained by observable characteristics (Betts, 2019). The main objective is to identify determinants of household vulnerability to poverty and estimate the likelihood of being vulnerable or falling into poverty, considering consumption instability and other characteristics. To analyze vulnerability, the study follows the Vulnerability as Expected Poverty (VEP) approach, defined as the probability that a household's consumption will fall below the poverty line in the future (Heitzmann *et al*., 2002; Christiaensen and Subbarao, 2005). This methodology involves three steps: Estimating the consumption function, predicting the expected log consumption and variance of the error term for each household, and calculating vulnerability as the probability that consumption will fall below the poverty line (Ligon and Schechter, 2004). The VEP approach involves estimating a consumption model as follows:

$$Log(C_{it}) = \beta X_{it} + \epsilon_{it}$$

where, $Log\ (C_{it})$ is the log of consumption of household I at time t, X_{it} is a vector of household characteristics, β is a vector of parameters to be estimated and ϵ_{it} is the error term. The expected consumption is then:

$$\hat{E}(\log(C_{it})) = \hat{\beta} X_{it}$$

The variance of the error term, $\sigma^2(\epsilon_{it})$, is estimated from the residuals of the consumption model:

$$\widehat{\sigma^2}(\epsilon_{it}) = \frac{1}{N-k} \sum_{i=1}^{N} \log(C_{it}) - \hat{E}(\log(C_{it}))^2$$

Vulnerability is then calculated as:

$$VEP_{it}\ Pr(log(C_{it}) < log(Z)) = \Phi\left(\frac{\log(Z) - \hat{E}(\log(C_{it}))}{\hat{\sigma}^2(\epsilon_{it})}\right)$$

where, Z is the poverty line and Φ is the cumulative distribution function of the standard normal distribution.

This approach allows for the identification of households that are not currently poor but are vulnerable to falling into poverty due to consumption instability and other risk factors. It provides insights into the factors that drive vulnerability and informs the design of policies aimed at reducing poverty and vulnerability in the long term.

The Alkire foster method is a model that determines poverty by assessing the various types of deprivations that individuals may suffer from (Biira, 2016). This model consolidates this information to provide a comprehensive reflection of societal poverty that can be easily analyzed by indicators or segmented by geographic region, ethnicity, gender, and other social groups. By identifying

the interconnectedness of deprivations, measures created using the Alkire-Foster model can enhance policy design and improve poverty reduction efforts (Alkire, 2013). The Alkire Foster model is an immensely powerful tool that enables us to accurately identify the percentage of households and refugees in the Western and West Nile sub-regions of Uganda who are vulnerable to poverty (Alkire *et al.*, 2015). This model is highly flexible and takes into account a wide range of indicators, cut-offs, and weights to determine the intensity of vulnerability experienced by each household. Its extensive use stems from its ability to provide a comprehensive dimensional analysis of selected indicators, which enables us to measure poverty levels among host and refugee communities with a high degree of accuracy. This study adopts and uses an index model constructed by the Alkire Foster method to evaluate the poverty status of host and refugee communities and analyze the impact of state and development partner interventions in mitigating their vulnerability to poverty (Schneiderheinze and Lücke, 2020). With this powerful tool at its disposal, this study was able to identify poverty levels and assess the effectiveness of interventions aimed at reducing poverty, potential access to land, farm inputs, markets, clean and safe drinking water, main sources of food and incomes, employment, barter trade, health, and education services.

The paper established and determined the relationship between refugees in settlement camps and host communities and how strong this relationship in promoting peaceful co-existence and participation in joint agricultural activities is responsible for connecting and cementing cultural, social, and economic values. To investigate the kinds and nature of poverty that exists among the fleeing refugees and refugees host individual households living in various communities of the Western and West Nile sub-regions of Uganda and to determine the number of refugees in settlement camps and host communities from the six refugee camps, use a vector of indicator weights, $w = (w_1 \ldots w_d)$, where w_j represents the weight assigned to measurement indicators j such that $\sum_{j=1}^{d} w_j = d$. The study creates a deprivation matrix $g^0 = [g_{ij}^0]$ by defining g_{ij}^0 i as $g_{ij}^0 = w_j$ if $x_i < z_j$ and when $g_{ij}^0 = 0$ otherwise [as equal to w_j if $x_{ij} < z_j$ and zero otherwise]. The paper also establishes a vector of deprivation count for refugees and host communities, represented by $c = [c_i]$ whose value elements are defined as $c_i = \sum_{j=1}^{d} g_{ij}^0$ where c_i is the weighted number of deprivations suffered by individual household heads i. To identify the poorest and most vulnerable refugees in refugee settlement camps and host communities, the study introduces the function $p_k (x_i; z)$ such that $p_k (x_i; z)$ is equal to 1 and if $c_i \geq k$ where k is the weighted deprivation required to be considered poor or vulnerable and $pk (xi; z) = 0$ otherwise. is marginally or found to be poor or vulnerable to household and community poverty and $p_k (x_i; z) = 0$ otherwise.

This refers to the parameter k to mean the poverty line (cutoff) that ranges from the minimum weight assigned to any measurement indicators including access to land, farm inputs, markets, clean and safe drinking water, main sources of food and incomes, employment, barter trade, health and education services which corresponds to the union criterion $\min (w_j) \leq k \leq d$. The household and community poverty line or cutoff k could be the equivalent proportion rather than the number of the weighted deprivation the individual refugees and host community household head need to experience to be identified or categorized as vulnerable to both household and community poverty (poor). If this is the case an individual i is poor and vulnerable whenever $(C_i/d) \geq k$ where $[\min (w_j) /d] \leq k \leq 1$. Recalling that P_k entirely depends on both the indicators variable cutoff z_j and the poverty cutoff k and this is the reason why *AF* methodology is used in this analysis because it allows a dual cutoff method of identification and categorization of the poor and vulnerable household heads structured into three distinct sections. The initial segment focuses on measuring poverty dynamics in the region through both consumption-based and asset-based approaches. In the second phase, a three-step Feasible Generalized Least Squares (FGLS) is utilized to scrutinize household vulnerability to both household poverty and community poverty (Miller and Startz, 2017). The third approach involves the application of fixed effects instrumental variable and Multinomial Logit models (MNL) to evaluate and identify the factors contributing to household poverty and household vulnerability to poverty (Alkire, 2014). This evaluation is conducted in comparison to the estimation of poverty and vulnerability using the consumption-based approach and an asset-based method (Miller and Startz, 2017).

A Consumption-Based Strategy

The study established and examined different income grouping levels of refugees and host households living in various communities. This approach defines poverty for both refugee and host community household heads as having a real monthly consumption expenditure per adult equivalent that falls below UGX 3,904.54 or USD 30 between 2020 and 2022 at Purchasing Power Parity (PPP) prices. Uganda's GDP per capita, when adjusted by PPP, was last recorded at USD 2,246.41 in 2021, equivalent to 13% of the world average (World Bank, 2019). The poverty threshold is set precisely at 1 USD per adult per day during 2020-2022 at PPP prices, which is equivalent to USD 2,246.41 per adult per day. By using this cutoff point, the analyzed poverty incidence trends in absolute terms over the panel years.

Asset-Based Approach

The Principal Component Approach (PCA), a principal component technique, is employed in the asset-

based strategy to construct relative poverty indices. A dataset containing possibly correlated variables can be transformed into a set of values reflecting linearly uncorrelated variables using the mathematical technique known as Principal Component Analysis (PCA) (Alkire *et al.*, 2015). This method is employed to simplify the complexity of high-dimensional data by identifying patterns and capturing the most significant information in the original variables (Alkire *et al.*, 2015). The resulting set of uncorrelated variables, known as principal components, allows for a more efficient representation of the data while retaining the essential information. *PCA* is widely used in various fields, including statistics, econometrics analysis on household behavior and coping mechanisms, and data analysis on how to reduce the dimensionality of poverty and vulnerability and uncover underlying structures within datasets. Related components are broken down into fewer principal components because they assess the same construct. Consequently, the prime element is a function of all factors that refugees and host communities require to accelerate their welfare which include land, farm inputs, access to markets, clean and safe drinking water, sources of food and incomes, employment, barter trade, health and education services as aggregated in Eq. (1):

$$PCA = f \tag{1}$$

Land, farm inputs, markets, water, food, incomes, consumption expenditure, employment, barter trade, health and education.

To condense the variables into a single composite index, the poverty index *PCA* is applied in the analysis to determine the score of each of the variables on a particular *PCA* using a formula to calculate scores for the first component recovered in a *PCA* found below in its general form Eq. (2):

$$PCA_1 = \theta_{11}(x_1) + \theta_{12}(x_2) + \theta_{13}(x_3) + \ldots + \theta_{1p}(x_p) \tag{2}$$

The regression coefficient (or weight) for an observed variable θ_{1P} as utilized in the creation of the main element as shown in Eq. (1), is the score on principal component 1 and χ_p (the initial element retrieved) and it corresponds to the value that is contained inside the variable that was observed p. To establish refugees' and host communities' vulnerabilities to poverty in the six refugee settlement camps, the poverty index for each of the households is shown in Eq. (3):

$$PI_j = \sum F_i[(X_{ji} - \mu_i)/\sigma_i] \tag{3}$$

where, PI_j is the poverty index for both refugees and host communities' households (group) j, F_i is the factor score that represents the weight of the ith variable in the *PCA*; X_{ji} is the value of ith, the variable for the jth household

(PA), described by the mean μ_i and standard deviations σ_i of the variable i^{th} from the homes (groups) of refugees and host communities as a whole.

The poverty index has a mean value of 0 by construction. To make the index comparable to one another between refugees and host communities, employ the innovative approach (Alkire, 2013). Thus, this study obtained and combined available data on refugees obtained from OPM the total population of the households where refugee settlement camps are established from UBOS. A three-year dataset from 2020, 2021, and 2022 was combined and used to estimate the PCA over the combined data (UBOS, 2019). The resulting weight from the dataset was subsequently used by incorporating Eq. 3, to apply to the variable values for every data cycle.

Decomposing Vulnerability to Poverty

The enchantments and elements technique is the most commonly utilized method of decomposing poverty dynamics. In the present investigation, this study employs each approach, although the analysis placed a greater focus on the latter because it allows for more accurate data surrounding how households' consumption expenditures connect to the poverty line (Duclos *et al.*, 2010). The components procedure, created by Rodgers and Rodgers (1993) and implemented by Jalan and Ravalli (1998), has been explained briefly here. Using panel data Jalan and Ravallion separated household poverty into permanent and cyclical components (Jalan and Ravallion, 1998). When a household's intertemporal mean consumption falls outside the poverty line, it is considered to be in chronic poverty. Equation 4 provides a mathematical representation of the approach used to calculate the household I contribution of refugees and the host community to overall poverty (Duclos *et al.*, 2010):

$$\rho i = \rho(y_{i1}, y_{i2}, y_{i3} \ldots \ldots \ldots \ldots \ldots y_{iT}) \tag{4}$$

where, y_{i1} denotes a certain household's consumption level expenditures of a given household i at time t and there are T periods when it is recorded and ρi represents a well-defined poverty indicator or measure. Because of its associated decomposability elements, the study employed the well-known Foster-Greer-Thorbecke (FGT) measure.

As a result, the inter-temporal mean of the poverty indicator or measure is used to calculate total poverty rates for households across the period in question:

$$\bar{P}\iota = {}^{1}/_{T} \sum Pi \tag{5}$$

where, T is the total number of years and $\bar{P}\iota$ is the mean of the FGT indicator or measure of poverty in its entirety. As a result, persistent poverty is quantified in Eq. 6:

$$Pi^* = \frac{1}{n} \sum_{i=1}^{m^*} \left(\frac{z - \bar{y}_i}{z}\right)^{\alpha} \text{ if } Z > \bar{y}_i; 0 \text{ otherwise} \tag{6}$$

where, element z denotes the poverty rate or levels of both the individual refugee and refugee host community households, element $\bar{y}_i$ of the variable understudy is the main household mean consumption expenditure represented by i, m^* within the model is the total number of households who leave below the poverty line cut-off of both refugees-host communities and n is the number of households in the study sample.

Element α in the model is considered a positive parameter which gives more weight in measuring and identifying the poor and vulnerable refugees and refugees host community households. The most common values of α are 0, 1, and 2. The transient or chronic poverty $\tilde{p}_i$ calculates the difference between total poverty rates $\bar{P}_i$ and transient or chronic poverty p_i^* Hereafter, once chronic or transient poverty is measured that makes it finding temporary poverty levels like Eq. (7) appears to be more likely achievable easily Eq. (7):

$$\tilde{p}i = \bar{P}_i - Pi^* \tag{7}$$

To understand the nature of poverty dynamics among the fleeing refugees from DRC-Congo and South Sudan (SS) and the refugee's host community households in the Western and West Nile sub-regions of Uganda, the Foster-Greer-Thorbecke (FGT) approach is a good fit for the PCA (Alkire *et al.*, 2015). Reviewing the related texts and determining the poverty rates or status among the study sample (refugees and host community households) during each of the study periods was the first step in the use of the help of Foster-Greer-Thorbeck (FGT) approach (Alkire *et al.*, 2015). The transitional matrix table was drawn and this transitional matrix tool was used to investigate the kinds and nature of poverty that exists among the refugees and refugees host communities of Western and West Nile sub-regions of Uganda. Different income groupings and their sources were also created by categorizing and determining refugees and refugee host individuals living in various communities' income levels (Alkire *et al.*, 2015). The percentage or quantity of the refugees and refugee host community individual households transiting from one stage of poverty to another was calculated as shown in Table 3.

Calculating how long an entire family of a refugee and host community households has lived in any form of poverty, a change in poverty indicators can, additionally offer statistics about both transient and chronic poverty. The model used in this study measures and considers a household to be "transient poor" if its income or consumption exceeds the specified poverty limit for at least one of the periods during which the welfare indicator was monitored. Welfare indicators, which include Social Security Assistance (SSA) under the broader Social Protection Programmes (SPP), benefit the chronically underprivileged (impoverished) poor, who were consistently assumed to live below the cut-off poverty

level (Alkire *et al.*, 2015). In this work, on the other hand, to characterize a household as chronically poor he/she must fall below the poverty line or not meet the measurement of the study indicators during the survey visits to both refugee camps and host communities. Using the Shorrocks mobility index, it was easy to see poverty dynamics once the transition matrix or indicator was applied. Equation (8) provides the Shorrocks Mobility Index, or M, for the change in the poverty matrix or indicator (Alkire *et al.*, 2015):

$$M(P) = {}^{n - tracep}/_{n - 1} \tag{8}$$

where, P is the trace of the transition poverty matrix or indicator P and n is the number of refugees in settlement camps and host communities' households (quartiles or deciles) from western and west Nile sub-regions of Uganda for example. Index normalization requires dividing the index by obtaining a value between 0 and $1\frac{n}{n-1}$.

The more mobile fleeing refugees are, the closer the Shorrock's mobility index is to one. Explaining why individuals become and stay impoverished throughout time is necessary for a comprehensive explanation of poverty. The research examined how social security assistance within broader social protection programs impacts the characteristics of households in both refugee and host communities. The study identified policy-related variables through regression-based models at the micro level, providing decision-makers and policymakers with tools to enhance the well-being of individual households in both refugee and host communities. Two models, namely the fixed effects instrumental variable and the random effects model, were employed to account for unobserved differences among households and random effects, respectively, as outlined in Eq. (9):

$$\ln y_{it} = d'_{it}\sigma + \chi'_{it}\beta + t'_{it}\theta + \alpha_i + u_{it} \tag{9}$$

$$d_{it} = f(x_{it}, z_{it}, t_{it}, v_{it})i$$
$$= 1,2,3,\ldots\ldots\ldots N; t = 1,2,3,\ldots\ldots\ldots T \tag{10}$$

The asset poverty index, measured as the logarithm of actual consumption expenditure per adult equivalent$1ny_{it}$, was utilized as the dependent variable in the initial fixed effects model, denoted by Eq. 9. This was analyzed against a collection of identified endogenous variables, exogenous variables, period dummies χ_{it}, and unobserved household fixed effects α_i. The research regresses the endogenous variables in Eq. 10 against the other variables in the system and a set of instrumental variables z_{it} to estimate their expected values. The predicted values of the endogenous variables and their lagged values u_{it} and v_{it} serve as instruments in Eq. 9. In the corresponding equations, these are peculiar error terms. The study employed the Multinomial Logit Model (MLM) to analyze factors influencing chronic poverty

probability, offering ease of specification but imposing independence of irrelevant alternatives. Depending on whether the household was poor, moderately poor before, during, or after the survey, or never poor, the regressed variable in the model takes values of 0, 1, or 2 the model was applied to satisfy the analysis requirement based on the data sets of refugees and host communities' households. The coefficient values for two categories about a third excluded group the never-poor in this case are determined via the multinomial logit regression.

On the other hand, the results were straightforward to understand when considering marginal effects and their importance. These illustrate how each explanatory variable affects the probability that a household will belong to one of the three categories. Household consumption expenditure was the main social security welfare metric or indicator under the broader social protection interventions considered. However, measurement errors may distort the poverty level computed from household consumption expenditure or spending, just like they do any other socioeconomic indicator. On the other hand, it was demonstrated using the OPM and UBOS data that measurement error does not significantly alter consumption-based mobility estimations. In the model, the dependent variable can take on one of three discrete values representing a family's poverty status: Non-poor, transitory poor, or chronically poor. The model illustrates the probability (P_{ij}) that family i falls into a specific poverty category j as a function of explanatory variables X_i. The values of j range from 0 to 2, where $(j = 0)$ signifies non-poor, $(j = 1)$ signifies transitory poor, and $(j = 2)$ signifies chronically poor. The equation for this model is presented as follows:

$$P_{ij} = Prob(poverty = j) = \frac{e^{X_i'\beta_j}}{1 + \sum_{k=1}^{2} e^{X_i'\beta_k}}$$

Here, β_j represents the vector of coefficients in the model for category (j). For model identification, the β_0 parameter for the non-poor category $(j = 0)$ is set to zero. Consequently, the non-poor state $(j = 0)$ serves as the reference category in the regressions based on the given equation (Duclos *et al.*, 2010).

The Sample Size and Demographic Characteristics of the Participants

The size and sex composition of a population are fundamental factors for comprehending population characteristics over time Krejcie and Morgan (1970). These parameters denote the count of refugees and individual households hosting refugees residing in different communities, categorized by gender in the society where they live. These figures are derived from the resources they utilize to generate income, aiming to

enhance the overall social and economic well-being, whether they are refugees or native citizens. Furthermore, these demographic aspects bear substantial implications for reproductive potential, human resources, rates of school attendance and completion, formation of family structures, healthcare, and the provision of social protection services. The sample population size of the selected participants of the refugees selected from Western and West Nile sub-region findings of the study are presented in Table 1. This compares well with the refugee data obtained from OPM for refugee immigrants and UBOS for the national population Krejcie and Morgan (1970). The research incorporated two types of data analysis: Descriptive analysis and inferential analysis. The descriptive analysis aimed to examine the demographic characteristics of the chosen respondents from both the refugee and host communities. It also delved into the primary agricultural activities undertaken by both groups, highlighting the challenges faced during these activities and proposing solutions.

The analysis drew on OPM periodic data, providing valuable information used to map out the dynamics of poverty among refugees and host communities (Clements *et al.*, 2016; Feins, 2017). This dual approach helped provide a comprehensive understanding of the studied populations and their agricultural practices, challenges, and potential solutions. This research contends that poverty is not a monolithic and homogenous condition. Instead, it identifies significant variations and mobility factors within the impoverished population. While Krejcie and Morgan's (1970) sample size chart recommends a sample size of 217 for a 500-population cross-section, this study emphasizes the complexity of poverty, suggesting that a nuanced and detailed approach is required to capture the diverse experiences and circumstances within the broader category of poverty in which researchers must assess if this size is sufficient for accurate judgments is enough, the next section demonstrates the sample size estimate using Cohen (1988) statistical power analysis. At a 95% confidence level with the degree of freedom, one (01) the chi-square value (x^2) is equal to 3.841, and at a 95% confidence level, the margin of error (e^2) is equal to 0.05, the proportion (p) is 50% also taken as 0.5 and the population size (N) is equal to 25,000, we compute the required study using the Krejcie and Morgan (1970) sample size chart model given that:

$$n = \frac{X^2 NP(1-P)}{e^2(N-1) + X^2 P(1-P)}$$

The chi-square value (x^2) is equal to 3.841 at a 95% confidence level, the margin of error (e^2) is equal to 0.05, the proportion (p) is 50 percent also taken as 0.5 and the population size (N) is equal to 25,000:

$$n = \frac{3.841 \cdot 25000 \cdot 0.5 \cdot (1-0.5)}{0.05^2 \cdot (25000-1) + 3.841 \cdot 0.5 \cdot (1-0.5)}$$

$$n = \frac{3.841 \cdot 25000 \cdot 0.25}{0.0025 \cdot 24999 + 3.841 \cdot 0.25}$$

$$n = \frac{3.841 \cdot 6250}{0.0624975 \cdot 24999 + 0.96025}$$

$$n = \frac{24012.5}{1562.4375 + 0.96025}$$

$$n = \frac{24012.5}{1563.39775} = 15.36$$

This result indicates that the calculated sample size is approximately 15. However, since sample sizes are typically whole numbers, we would round up to the nearest whole number if necessary. However, such a small sample size seems unusual given the large population and margin of error. We re-evaluate the steps in detail by computing the numerator and denominator.

The numerator: $x^2 \cdot N \cdot (1 - \rho \cdot (1 - \rho) = 3.841 \cdot 25000 \cdot 0.5 \cdot 0.5 = 24012.5$ and the denominator $e^2 \cdot (N - 1) + X^2 \cdot \rho \cdot (1 - \rho) = 0.0025 \cdot 24999 + 3.841 \cdot 0.25 = 62.4975 + 0.96025 = 63.4$. We divide the numerator by the denominator:

$$n = \frac{24012.5}{63.45775} = 378.43$$

$$n \approx 378$$

Therefore, the required sample size using Krejcie and Morgan's (1970) formula for a population of 25,000 with a 95% confidence level, 0.05 margin of error, and proportion of 0.5 is approximately 378. This formula helps researchers determine the appropriate sample size needed for a survey or study, considering the specified population size, margin of error, and confidence level. Where: n = desirable sample size, N = population size, e^2 = margin of error (0.05) at a 95% confidence level or degree of precision represented as a proportion (.05), P = population proportion (assumed to be 50 because this would offer the maximum sample size) and X^2 is Chi-Square value that corresponding to the 95% confidence interval. Based on the data, the gender distribution is almost equal with 48.9% male and 51.1% female. In terms of age distribution, females are predominantly younger, with the highest percentage in the 14-19 age group, while males are similarly distributed, with a slightly higher percentage in the 20-24 age group. The sample also shows a significant proportion of widowed individuals (30.2%), followed by singles (25.1%) in terms of marital status. From Table 1 Out of the 378 total respondents, 185 (48.9%) are male, while 193 (51.1%) are female. Among the female respondents, 69 (35.8%) are aged between 14 and 19, 66 (34.2%) are aged between 20 and 24, 44 (22.8%) are aged between 25 and 29 and 14 (7.3%) are aged 40 and above. For the male respondents, 59 (31.9%) are aged 14-19, 62 (33.5%) are aged 20-24, 51 (27.6%) are aged 25-29 and 13 (7.0%) are aged 40 and above. In terms of marital status, 95 (25.1%) respondents are single,

67 (17.7%) are cohabiting, 54 (14.3%) are married, 48 (12.7%) are divorced and 114 (30.2%) are widowed.

This study analyzed the demographic features of selected individual refugees and the host community populations to determine and reflect on the respondent's fairness and willingness to participate in the study process. Table 1 captures the gender, household head marital status, age, and number of household members both children by age category, adults and elderly of the selected respondents considered in the analysis. The duration of stays in refugee settlement camps in terms of months and years, their country of origin, the household size, and the respondent's household status are presented in Table 2.

Household size: This data highlights the size of refugee households, a critical factor for understanding their vulnerability to poverty shocks in terms of resource allocation, dependency ratios, and coping mechanisms. The findings unequivocally show that 138 households (36.5% of the sample) had between 2 and 8 members, followed by 123 households (32.5%) with more than 9 members and 117 households (31.0%) with 1 to 4 members. It is evident that larger households may face distinct challenges and possess different capacities to manage poverty shocks compared to smaller households. Table 2 for more details.

Respondent's status: This variable is critical in identifying the status of the household head, influencing decision-making power, access to resources, and vulnerability to poverty shocks. According to Table 2, the distribution of household heads shows a relatively balanced representation among male household heads (N = 117, 31.0%), female household heads (N = 135, 35.7%), and child-headed households (N = 126, 33.3%). Understanding the composition of household heads is indispensable for accurately assessing vulnerability and developing targeted interventions.

Table 1: Shows the population sample size

Variable	N = 378	% (N)
Respondent gender by category		
Male	185	48.9
Female	193	51.1
Female age		
14-19	69	35.8
20-24	66	34.2
25-29	44	22.8
40 and above	14	7.3
Male age		
14-19	59	31.9
20-24	62	33.5
25-29	51	27.6
40+	13	7.0
Marital status		
Single	95	25.1
Cohabiting	67	17.7
Married	54	14.3
Divorced	48	12.7
Widowed	114	30.2

Source: Own computation using field data

Table 2: Shows the number of refugee respondents

Variable	N = 378	% (N)
Respondent gender by category		
Male	185	48.9
Female	193	51.1
Duration in refugee settlement camps		
1-10 months	111	29,4
1-7 years	106	28,0
1-5 years	93	24,6
11 years and above	68	18,0
Country of origin		
DRC-congo	158	41,8
South Sudan	187	49,5
Burundi	33	8,7
Household size		
1-4 members	117	31,0
2-8 members	138	36,5
Above 9 members	123	32,5
Respondent's status		
Male household head	117	31,0
Female household head	135	35,7
Child-headed households	126	33,3

Source: Own computation using field data

Table 2 provides valuable demographic information about the refugee respondents, which is essential for contextualizing their vulnerability to idiosyncratic and covariate causes of poverty shocks in Uganda, as stated in the study title. This data, along with other findings from the study, if adopted can help the policymakers and practitioners to develop more effective strategies to support refugee and host community households in the face of poverty shocks. Table 2 shows the distribution of duration in refugee settlement camps as follows: 1-10 months (N = 111, 29.4%), 1-7 years (N = 106, 28.0%), 1-5 years (N = 93, 24.6%) and 11 years and above (N = 68, 18.0%). These percentages represent the length of time respondents have spent in refugee camps. In terms of the respondents' Country of Origin, the survey results indicate the following distribution: DRC-Congo (N = 158, 41.8%): 158 respondents originate from the Democratic Republic of Congo, representing 41.8% of the sample. South Sudan (N = 187, 49.5%): 187 respondents hail from South Sudan, making up 49.5% of the sample. Burundi (N = 33, 8.7%): 33 respondents come from Burundi, accounting for 8.7% of the sample. In terms of responsibilities, most families interviewed were children who had the main responsibilities of the family. Households are fairly evenly distributed across different sizes, with the largest group having 2-8 members (36.5%). Respondent's status: Households are headed by males (31.0%), females (35.7%), and children (33.3%).

The impoverished and vulnerable non-poor refugees and host communities in Western and West Nile refugee settlement camps are both affected by periodic shocks that further exacerbate their already difficult living conditions due to poverty. Certain factors aid in their efforts to escape poverty. Jacobsen (2016) particularly emphasized the concept of household vulnerability to poverty, which has persistently hindered the coping mechanisms of poor households, exacerbated by insecurities and violent conflicts. Today, most households of displaced refugees and host communities in the Western and West Nile region are striving to deal with various coping strategies to navigate life's structural and crisis-related challenges. H_1: There is a strong relationship between refugees in settlement camps and host community population, H_2: Refugees in settlement camps and host community population participation in agricultural activities connects them to better and improved household welfare, and H_3: Refugees in settlement camps and host community population income and assets earned is positively influenced by their participation in economic agricultural activities.

Results and Discussion

This section presents empirical results regarding the decomposition of poverty increase and inequality effects across various settlements in Uganda. The analysis derived from Table 3 revealed notable insights into the dynamics of poverty and inequality within various settlements in Uganda, particularly among refugee and host community households. The empirical results demonstrated diverse patterns of change in poverty levels and inequality across different settlements, shedding light on the vulnerability of these populations to poverty shocks. In interpreting the findings through the lens of vulnerability theory, it became evident that negative changes in poverty levels within certain settlements indicated a degree of resilience or adaptive capacity among households, suggesting lower vulnerability to poverty shocks. Equally, positive changes in poverty or increases in inequality highlighted heightened vulnerability, where households may face challenges in coping with and recovering from poverty shocks effectively. This aligns with the core tenets of vulnerability theory (UNDP, 2017), which emphasize the dynamic nature of vulnerability and the importance of understanding the underlying factors that shape households' resilience or susceptibility to adverse events (UNDP, 2017).

Table 3: Decomposing poverty increase and distribution effects

	Increase	Inequality	Increase	Inequality
Bidi settlement	-1.7	3.8	0.2	-1.4
Imvepi refugee settlement.	-3.1	4.5	-0.8	-0.7
Kampala urban settlement.	-1.1	0.2	1.6	0.8
Kyaka II settlement.	0.2	2.1	-0.4	0.6
Kyangwali settlement.	6.7	3.7	-13.9	3.5
Rhino settlement.	-11.1	3.1	5.9	-2.2
Rwamwanja.	-1.6	3.4	4.6	-1.6

Source: Own computation using field data

Furthermore, the analysis, viewed through the livelihood framework, underscored the significance of livelihood diversification, access to productive assets, social capital, and institutional support in enhancing households' resilience to poverty shocks (OPM *et al*., 2016). Positive changes in poverty or increases in inequality may indicate that households' livelihood assets and strategies are insufficient to cope with and recover from poverty shocks effectively (OPM *et al*., 2016). Thus, interventions aimed at strengthening livelihoods, promoting asset accumulation, improving access to markets and social services, and building social networks are crucial for enhancing households' adaptive capacity and reducing vulnerability (OPM *et al*., 2016). Overall, the findings of the analysis provide valuable insights for policymakers and practitioners seeking to address the vulnerability of refugee and host community households to poverty shocks in Uganda. By understanding the dynamics of poverty and inequality within different settlements and integrating theoretical insights with empirical evidence, targeted interventions can be developed to promote inclusive development, reduce vulnerability, and enhance households' adaptive capacity in the face of poverty shocks.

Decomposing Poverty Increase

Table 3 column one on increase indicates the change in poverty levels in each settlement, which is crucial for understanding the extent of vulnerability to poverty shocks among both refugees and host communities. The negative values represent a decrease in poverty, while positive values represent an increase. For example, in Bidi Bidi Settlement and Imvepi refugee settlement, there are decreases in poverty (-1.9 and -2.1, respectively), suggesting potential improvements in economic conditions or welfare within these settlements. On the other hand, the Kyangwali settlement shows a significant increase in poverty (6.8), indicating heightened vulnerability to poverty shocks in that area.

Decomposing the Variable Increase and Inequality Effects

Table 3 offers valuable insights into the impact of idiosyncratic and covariate causes of poverty shocks on poverty and inequality across various refugee and host community settlements in Uganda. In addition, Table 3 further dissects the changes in poverty and inequality into two categories: Increase and inequality. Increase: Represents the change in poverty levels due to shocks. Positive values indicate an increase in poverty, while negative values indicate a decrease in poverty. Inequality: Represents the change in inequality due to shocks. Positive values indicate an increase in inequality, while negative values indicate a decrease in inequality. Here are the results for each settlement: Bidi Bidi settlement: Increase: -1.7 (indicating a decrease in poverty by 1.7 units)

inequality: 3.8 (indicating an increase in inequality by 3.8 units). Additional metrics: 0.2 (minor increase in poverty), -1.4 (slight decrease in inequality) Imvepi refugee settlement: Increase: -3.1 (indicating a decrease in poverty by 3.1 units) inequality: 4.5 (indicating an increase in inequality by 4.5 units). Additional metrics: -0.8 (decrease in poverty), -0.7 (decrease in inequality) Kampala Urban settlement: Increase: -1.1 (indicating a decrease in poverty by 1.1 units) -Inequality: 0.2 (indicating a slight increase in inequality by 0.2 units). Additional metrics: 1.6 (increase in poverty), 0.8 (increase in inequality) Kyaka II settlement: Increase: 0.2 (indicating an increase in poverty by 0.2 units) inequality: 2.1 (indicating an increase in inequality by 2.1 units). Additional metrics: -0.4 (decrease in poverty), 0.6 (increase in inequality) Kyangwali settlement: Increase: 6.7 (indicating a significant increase in poverty by 6.7 units) Inequality: 3.7 (indicating an increase in inequality by 3.7 units). Additional metrics: -3.9 (significant decrease in poverty), 3.5 (increase in inequality) Rhino settlement: Increase: -11.1 (indicating a significant decrease in poverty by 11.1 units). Inequality: 3.1 (indicating an increase in inequality by 3.1 units). Additional metrics: 5.9 (increase in poverty), -2.2 (decrease in inequality) Rwamwanja Settlement: Increase: -1.6 (indicating a decrease in poverty by 1.6 units). Inequality: 3.4 (indicating an increase in inequality by 3.4 units). Additional metrics: 4.6 (increase in poverty), -1.6 (decrease in inequality) suggesting that poverty shocks may have disproportionately affected certain groups within these settlements. Thus, Table 3 presents insights into how poverty and inequality have been affected by idiosyncratic and covariate causes of poverty shocks across different settlements in Uganda.

Table 3 presents insights into how poverty and inequality have been affected by idiosyncratic and covariate causes of poverty shocks across different settlements in Uganda. By examining the changes in poverty and inequality within each settlement, policymakers and practitioners can better understand the dynamics of vulnerability and tailor interventions to address the specific needs of different communities. This analysis aligns with the study's focus on measuring vulnerability to poverty shocks among refugee and host community households in Uganda, as stated in the study title and text provided. In the Kyangwali Refugee Settlement Camp (RSC) for instance, had the inequality effect remained unchanged, poverty would have been reduced by -13.9% points. This suggests that a substantial increase in consumption contributed significantly to large reductions in poverty, surpassing the negative impact of rising inequality. On the contrary, in the Rhino and Rwamwanja RSC and Host Community Households (HCH), there was a slowdown in the increase of poverty, with improvements in redistribution failing to fully offset

this effect. As discussed previously, the results from the equation, where β_j represents a vector of coefficients, the parameter β_0 is set to be at 0 and j takes the values 0 and 1, non-poor, transient poor, and chronically poor. The non-poor state of both refugees and individual households in different refugee host communities ($j = 0$) is used as the base category to measure poverty rate levels in the regressions based on the equation provided.

Additional analysis further, reveals that both the host community and the refugee population are engaged in a variety of income-generating activities to support their families. Both refugees and host community household heads have been able to assist their family members, notably in the areas of food nutrition, clothes, medical treatment, and social gatherings, thanks to cash obtained from the sale of agricultural produce. The results further demonstrate that refugees and host community's household heads in the RSC and HCH have been engaging in a variety of subsistence farming activities that are categorical in scope, thanks to the support from the Ugandan government through the Ministry of disasters and Refugees in OPM and humanitarian development agencies such as the UNHCR, UNICEF, and UNDP. As the primary source of income for the refugees, farming has received high praise from both national and international agencies (UNHCR, 2020a-b). In RSC and HCH, where farming is a common source of income for refugees, essential information on climate-smart agriculture is being instilled in the locals. The analysis further, shows that both refugees and host communities have access to food and non-food items, with 90% having access to nutritional foodstuff, while consumption of eggs and animal products is consistently below 10%. The study shows that host communities and refugees balance their food diets by exchanging surplus items and sharing kitchen cooking utensils. This fluid informal market, influenced by the GoU and humanitarian relief agencies, demonstrates a demand and supply assumption for both communities.

It can be argued that refugee households in RSC and HCH are more likely to operate enterprises due to factors such as connections to trade markets, wealth, income sources, and training. Male and female heads are more likely to operate enterprises, while those with more assets, income-generating activities, and training participation are more likely to do so after displacement. Refugees in RSC and HCH are more likely to own businesses than those in other communities. Households receiving formal and informal social protection transfers, on the other hand, are less likely to run a business. Refugees with female or young-headed households in both refugee camps, financial security, diverse income sources, and involvement in social networks and training are more likely to own ventures that generate additional income. Elderly households, both refugees and the host individual household heads living in various communities are less

likely to diversify their income sources, resulting in a lower level of entrepreneurship.

The majority of refugees (66%) identify as crop farmers, while just 20% identify as agro-pastoralists. This also suggests that many of these refugees (14% say they do nothing). The split between the two lifestyles is more balanced in host communities, where only 56% identify as pure crop farmers and 44% as agro-pastoralists. A total of 97% of host communities and 95% of refugees say that they are involved in agricultural production; however, only 45% of host communities and 22% of refugees sell some of their output. Refugees often have limited access to land, with individual households having smaller tracts. Government programs are the most common means for refugees to access land, while host communities rely on inheritance or family ties. However, informal transactions like leases, borrowing, and share-cropping are becoming more common, highlighting the availability of underused land in settlements even without land lease agreements.

Land lease agreements between refugees and host communities might boost production and productivity by providing land for intensive agriculture. However, security is minimal due to a lack of recorded land rights. Refugee families produce fewer cattle than host communities, owing to concerns about disease transmission and access. Because of the turmoil in the DRC-Congo and South Sudan, the quantity of cattle being brought into Uganda is increasing. The most popular agricultural activity among the immigrants and the host communities is crop farming though practiced on a small scale since it does not require a significant huge initial investment to get started compared to other ventures. Additionally, both refugees and host communities may prefer to participate in agriculture and agriculture has been the main source of income for most households. However, most of the agricultural products produced by the refugees and host communities in RSC and HCH are subsistence in nature and the food produced is consumed by households and sold to a very limited number of urban centers. The same thing is happening in other areas not hosting refugee camps, where most crops produced, such as cassava, sweet potatoes, yams, cowpeas, maize, sorghum, beans, tomatoes, onions, and cabbages among others are almost consumed by the households within their localities (Frank *et al.*, 2018). Despite the lack of land, a sizable number of household heads in the host community and among the refugees retain animals, which they occasionally utilize to supplement their diets. They primarily raise their animals for milk production and meat for home consumption and sale, which has significantly improved their overall health and incomes.

Refugees typically receive a 50 by 50 m parcel of land segmented into plots for cultivation from the office of the Prime Minister (OPM), but the size of the plots has been reduced over time due to declining land availability and

the increasing population. Refugees consider the time they are likely to spend in the host community and they are reluctant to plan big investments for fear of making losses, which thus makes them end up joining the agriculture sector, though on a small scale. The poor are divided into three different classes according to Jacobsen (2016). The future poor are primarily marginal peasants who earn UGX 2,888 per year and possess up to 1.5 decimals of land. They made up about 21% of the rural population. The moderately impoverished fall somewhere above the UBOS's upper poverty threshold (2020). Of the villagers, it made up 29.2%. The lower UBOS poverty level is where the severely poor fall 22.7% of rural residents fell into this category. Among these groups, there is a lot of upward and downward mobility. Because of the numerous shocks and risk crises that support rural peasant livelihoods in the "tomorrow's poor" group, they are particularly susceptible and live below the national poverty line (Norton *et al.*, 2001).

The paper further, finds that changes in traditional marketing and purchasing channels of the crops being sold to the local markets by the refugees and host communities mean that both quantities purchased or sold and prices paid and or income earned or received are less observable. The study considers these changes to be more problematic for the sectors involved in aggregate measures of value added and income earned. Currently, income earned from the sale of agricultural products is measured at the household level as opposed to the farm-level estimates which have been used to generate information using a single integrated data collection instrument. This study can confidently confirm that this finding conforms to the study Hypothesis (H_1) on "There is a strong relationship between refugees in settlement camps and host community population" where about 111 (29.4%) refugees lived in refugee settlement camps for a period between 1-10 months, 106 (28.0%) refugees lived between 1-7 years, 93 (24.6%) of the refugees lived for about 1-5 years and 68 (18.0%) of the refugees lived for more than 11 years and above in both western and west Nile sub-regions. Their relationships (refugees and host communities) are mainly built around participation in the traditional marketing and purchasing channels of the crops sold to the local markets and paid casual work to earn was observed. Similar efforts were also undertaken by the researcher to investigate the dynamics of poverty using panel data from 21 villages that were involved in the poverty mapping project (Campenhout *et al.*, 2016). Even though approximately one-third of the families were firmly established in chronic poverty, this study found that there was significant mobility among the refugees and host communities poor in search of casual work. Khosla and Jena, (2020) investigated whether favorable natural circumstances or random causes were to blame for the growth in household asset position, which is a key

indicator of the upward mobility of the poor across all districts of Uganda. As a result, the analysis is both imperfect and incomplete. Therefore, based on the findings, it became certain that they are all ex-post retrospective assessments that do not consider future poverty analysis.

Policy Recommendation

In addressing the vulnerability of refugee and host community household heads to idiosyncratic and covariate causes of poverty shocks in Uganda, targeted interventions are essential. These interventions can be designed to measure vulnerability and implement strategies aimed at enhancing resilience and reducing poverty among affected populations.

One key intervention is the implementation of comprehensive vulnerability assessments. These assessments should involve rigorous data collection and analysis to identify the specific vulnerabilities faced by refugee and host community household heads. By assessing factors such as income levels, access to resources, social networks, and exposure to risks, policymakers and practitioners can gain a comprehensive understanding of vulnerability dynamics and prioritize interventions accordingly.

Moreover, targeted interventions should focus on enhancing livelihood opportunities and diversification strategies among refugee and host community household heads. This may include providing access to vocational training, microfinance services, and support for small-scale income-generating activities. By empowering household heads to generate alternative sources of income and build resilient livelihoods, they can better cope with and recover from poverty shocks. Additionally, interventions aimed at strengthening social protection measures are crucial for reducing vulnerability among refugee and host community household heads. This may involve expanding access to social security safety nets, such as cash transfer programs, food assistance, and healthcare services. By providing a buffer against economic shocks and supporting basic needs, social protection measures can mitigate the impact of poverty shocks and improve household resilience.

Furthermore, efforts to promote inclusive governance and community participation are essential for addressing vulnerability among refugee and host community household heads. Engaging communities in decision-making processes, enhancing access to justice, and fostering social cohesion can strengthen collective resilience and empower households to address their vulnerabilities effectively.

Targeted interventions that address vulnerability among refugee and host community household heads in Uganda should focus on comprehensive vulnerability assessments, livelihood enhancement, social protection mechanisms, and inclusive governance. By implementing

these interventions, policymakers and practitioners can measure vulnerability, build resilience, and reduce the impact of poverty shocks on affected populations.

Conclusion

The study on measuring refugees' and host community vulnerability to idiosyncratic and covariate causes of poverty shocks in Uganda underscores the multifaceted nature of migration and the challenges faced by displaced populations. Emergency migrations, often involuntary, are driven by a complex array of factors, with economic concerns prevailing among various migrant categories and political, religious, racial, and ethnic variables being significant in other scenarios. In Uganda, the self-reliance strategy within the refugee policy framework aims to economically empower refugees, primarily through subsistence agriculture. While praised as progressive, critiques regarding its execution have surfaced. Nevertheless, Uganda's rich endowment of natural resources, including ample agricultural land and a relatively low population density, presents opportunities for both refugees settled in camps and host communities accommodating refugees. Leveraging Uganda's natural resources can be pivotal in promoting the economic integration and self-reliance of refugees. Access to land, agricultural inputs, and training can empower refugees to engage in sustainable farming practices, bolstering food security and income generation. Moreover, fostering collaboration between refugees and host communities can foster social cohesion and mutual benefit. Despite challenges in implementing the self-reliance strategy, Uganda's natural resource base offers a promising foundation for supporting the economic well-being of refugees and host communities. By addressing implementation challenges and harnessing the potential of its natural assets, Uganda can continue to lead in refugee policy innovation, providing avenues for self-reliance and sustainable livelihoods for displaced populations affected by poverty shocks.

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