

Livelihood Strategies and Socioeconomic Adaptation of Resettled Households from the Mokattam Project in Asmarat District, Cairo, Egypt

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Abstract

Forced displacement profoundly impacted households' financial and social circumstances. This study analyzes the effects of adaptive livelihood strategies as well as economic shocks on the post-resettlement outcomes of households in the Asmarat district in Mokattam, Egypt. We adapted the model for sustainable livelihoods to analyze data from an interview of 693 households after resettlement from 2014 to 2024. The findings show that increasing earnings was a key strategy that positively influenced the livelihood outcomes of resettled households. The study emphasizes the significance for policymakers and urban planners by illustrating the positive effects of adopting a livelihoods approach to assess financial and activity outcomes for resettled households. It recommends developing comprehensive policies that address relocation and ensure the long-term, sustainable recovery of livelihoods and the overall well-being of resettled households.

Keywords

Adaptation; Asmarat; Egypt; livelihood; relocation; resettlement; shocks

Introduction

Urban poverty is evident worldwide through the spread of slums and informal settlements, characterized by high population density, insecure land tenure, lack of public infrastructure, poor-quality housing structures, and located in disaster-prone areas (UN-Habitat, 2014). Although the proportion of urban populations residing in slums declined from 46% to 30% from 1990 to 2014, the total number of individual inhabitants in these areas has risen to 880 million, compared to 689 million in 1990 (UN-Habitat, 2020). Given the ongoing increase in these figures, the problem of slums has emerged as a critical factor in perpetuating global poverty, hindering economic growth, and hindering the development of much human potential. To address these challenges, slum development projects have become essential and integral to the global development agenda for decades (World Bank, 2016).

Several alternatives exist to develop slums, such as on-site improvement or redevelopment. If on-site upgrading is not feasible, inhabitants are relocated to locations that offer superior livelihood prospects and infrastructure. Enhancing the proximity or connectivity of resettlement sites to the original location can lead to more sustainable and prosperous outcomes (American University in Cairo, 2014).

The prevalence of slum development in Egypt is primarily due to past neglect and inadequate planning for long-term urban solutions. In Egypt, the proliferation of informal settlements has become a significant urban concern. The gravity of this issue was underscored in 2008 when a rockslide led to the fatalities of 120 families in Dweika, an informal sector within the Manshiat Nasser settlement (Tadamun, 2020). The Egyptian government established the Slum Development Fund in 2008, classifying informal sectors as unplanned or unsafe. The categorization of hazardous areas has been expanded into four classifications based on the degree of risk and the urgency of intervention (American University in Cairo, 2014).

Egypt has recently witnessed a significant rise in initiatives to develop informal settlements and slums in various governorates. The government now undertakes the responsibility of eradicating hazardous neighborhood areas by demolishing them and relocating residents to fully serviced places. This included the Asmarat housing project in Mokattam, the most extensive program for relocating and resettling residents from informal and especially unsafe areas (Abdelkader et al., 2022).

An essential question regarding relocation and resettlement programs is whether residents would benefit more from upgrading to the exact location or relocating to an alternative place (Aboulnaga et al., 2021).

Research indicates that individuals who are either voluntarily or involuntarily resettled encounter various challenges in adjusting to a new social and physical environment after relocation. Involuntary resettlement is fundamentally distinct from voluntary population movements, mainly determined by 'push' forces, and lacks significant 'pull' factors (Asian Development Bank, 2014). Stress and uncertainty are associated with major population movements, yet they are more pronounced among involuntarily resettled individuals than those who relocate voluntarily for new opportunities. Furthermore, voluntary relocation programs generally attract younger individuals more likely to thrive in the new location. Voluntary resettled individuals usually migrate gradually, maintaining social and economic ties with their original communities. These connections offer a safety net in times of difficulty

and additional support for adaptation to their new relocation region. In contrast, involuntary relocation program initiatives are characterized by indiscriminate selection criteria, resulting in the simultaneous displacement of entire households and placing them in the same quandary (Partridge, 1993).

Studies investigating the impacts of relocation and resettlement programs have reached the consensus that these programs have multifaceted impacts on resettled individuals. These programs provide slum residents with secured tenure, infrastructure services, and improved and subsidized housing. Conversely, numerous studies have suggested that relocation and resettlement programs may generate new poverty gaps, which are referred to as 'recycling poverty.' This phenomenon results in the evacuation of certain families from resettlement sites and their subsequent return to slums and impoverished neighborhoods due to the collapse of the resettled individuals' original livelihoods (Nikuze et al., 2019).

Therefore, it is imperative to comprehend the intricacies of resettlement policies and their subtle influence on vulnerable resettled communities to develop more effective policies. This study examines the effects of economic shocks on household life satisfaction in the Asmarat district and the adaptation strategies utilized to alleviate these shocks.

The sustainable livelihoods framework is adapted to facilitate the identification of pathways through which resettled individuals diversify their livelihood strategies over time and to assess whether these changes result in a rise or reduction in their livelihood opportunities.

Study objective

The study's overall objective is to examine how adverse economic shocks caused by forced relocation and adaptation strategies to deal with these shocks affect the livelihood outcomes of resettled households in the Asmarat district.

Research questions

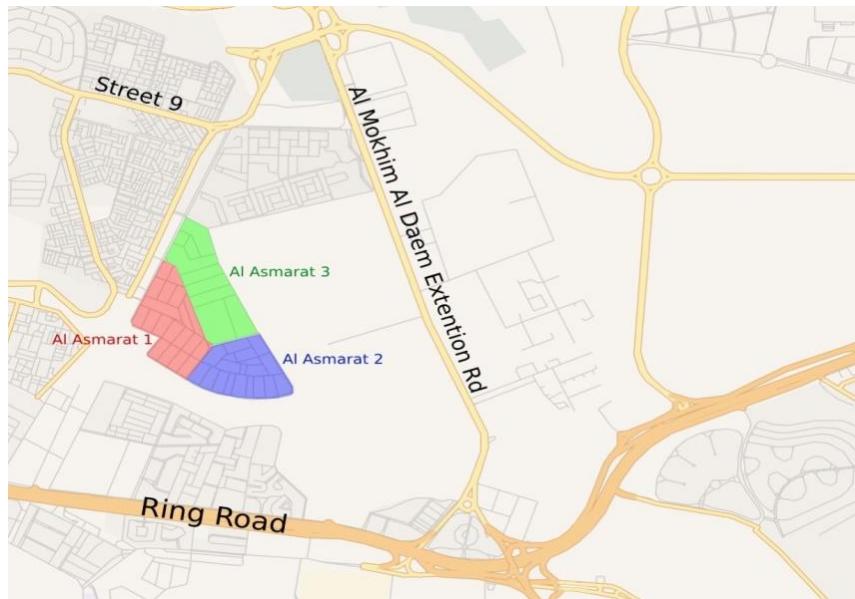
1. How do social and human capital interactions influence households' vulnerability to economic shocks from forced relocation in the Asmarat district?
2. How do adverse economic shocks after 10 years of resettlement influence households' livelihood adaptation strategies to cope with the economic shocks?
3. How do various livelihood adaptation strategies impact households' livelihood outcomes following resettlement in the Asmarat district?

Location of the study area

As shown in Figure 1, the resettlement site in Egypt is situated in the Mokattam neighborhood in the southern region of the Cairo Governorate. It is a government-managed urban resettlement community named the Asmarat district. The site was established to relocate slum households facing life-threatening conditions or affected by the implementation of

development projects, including national infrastructure initiatives or highways that may conflict with existing residential neighborhoods.

Figure 1: Map of Study Areas



Note: The researcher created the map using GIS

General characteristics of Mokattam

The Egyptian government established the Asmarat district between 2014 and 2020. It encompasses a land area of 188 acres, with 18,420 housing units (Ali & Ali, 2022). The establishment occurred in three phases, which are as follows:

- 1) Phase I was established on 65 acres and includes 6,138 housing units.
- 2) Phase II was established on 61 acres, totaling 4,722 housing units.
- 3) Phase III was established on 62 acres, comprising 7,440 housing units.

Additionally, various public service utilities are accessible, including medical centers, schools, commercial stores, cultural centers, shops, management units, playgrounds, youth centers, a mosque, and a church. The initial two phases occurred in 2015, whereas the third phase occurred in 2020. The resettlement of households from various poor areas and informal settlements in Cairo commenced in 2015. The Asmarat district represents the largest relocation initiative in Egypt, accommodating approximately 18,300 households and a total population of 80,000 individuals. The initiative offered adequate housing for individuals residing in dangerous circumstances, initially sourced from informal settlements such as Manshiyet Nasser, Ezbet Khairallah, Istabl Antar, and the Maspero area, all of which are deemed unsafe (Hamid, 2023).

The Asmarat district is situated approximately 12 km away from the original locations of the resettled households. The Asmarat district is located in a dynamic neighborhood with proximity to central services (medical centers, schools, commercial stores, cultural centers, shops, management units, playgrounds, youth centers, a mosque, and a church) and

infrastructure (roads, electricity, water, and gas), in contrast to earlier relocation programs that were established in remote desert areas like Masaken Othman (Ali & Ali, 2022).

Literature review

In light of the anticipated rise in involuntary population displacements this century, several scholars have advocated an increased emphasis on regulated resettlement as a viable response. Resettlement may represent a crucial protection for vulnerable populations lacking adequate support. Conversely, the historical performance of displacement programs associated with upgrading and development initiatives has been inadequate. Nevertheless, the comparatively more favorable outcomes of disaster-induced relocation suggest effective resettlement, indicating a potential for positive change.

There are two main explanations for the persistent challenges in resettlement. The first is insufficient inputs, including governance frameworks and funding. The second is the deficiency of essential inputs, including robust governance frameworks and adequate funding. The second involves the inherently complex nature of resettlement itself, a process that emerges from the dynamic interplay of social, economic, cultural, administrative, and governmental factors, often in unanticipated ways (Oliver-Smith & Sherbinin, 2014).

More than 66% of global refugees experience prolonged displacement, notably in the MENA region. This includes Palestinian refugees from the 1940s, along with Sahrawi and Kurdish populations, which the UNHCR identifies as some of the most persistent refugee groups, representing the organization's second oldest case burden. In these extended scenarios, refugees encounter significant socioeconomic and civil rights limitations, encompassing restricted access to employment, professional opportunities, entrepreneurship, and property ownership. Additionally, these refugees are often limited to camps or isolated settlements, leading to significant reliance on humanitarian aid. Refugee camps in the MENA region are frequently perceived as sources of instability, intensifying regional challenges (Hanafi, 2014).

Ebaid and Helmi (2024) aimed to design a comprehensive and sustainable resettlement strategy for the residents of Ain El-Sira. The main challenge in the relocation process is finding a suitable resettlement site that meets the residents' needs and offers long-term advantages. The resettlement strategy prioritizes mitigating service shortages, upgrading infrastructure, and alleviating building degradation to improve living conditions and sustainability for Ain El-Sira residents. The findings highlight the necessity of integrating various architectural techniques to formulate a comprehensive strategy that addresses immediate needs while fostering sustainable and lasting urban development.

Relocation has long-term effects; therefore, evaluating the success of resettlement projects based solely on short-term post-relocation data is insufficient. In this context, a study conducted in 2020 analyzed the long-term outcomes of resettlement in Nuevo Arenal, Costa Rica, a community displaced by the Arenal Hydroelectric Project's construction in 1977. The study utilized life history interviews, survey data, extensive social network analysis, and participant observation, concluding that the Arenal resettlement program is generally successful.

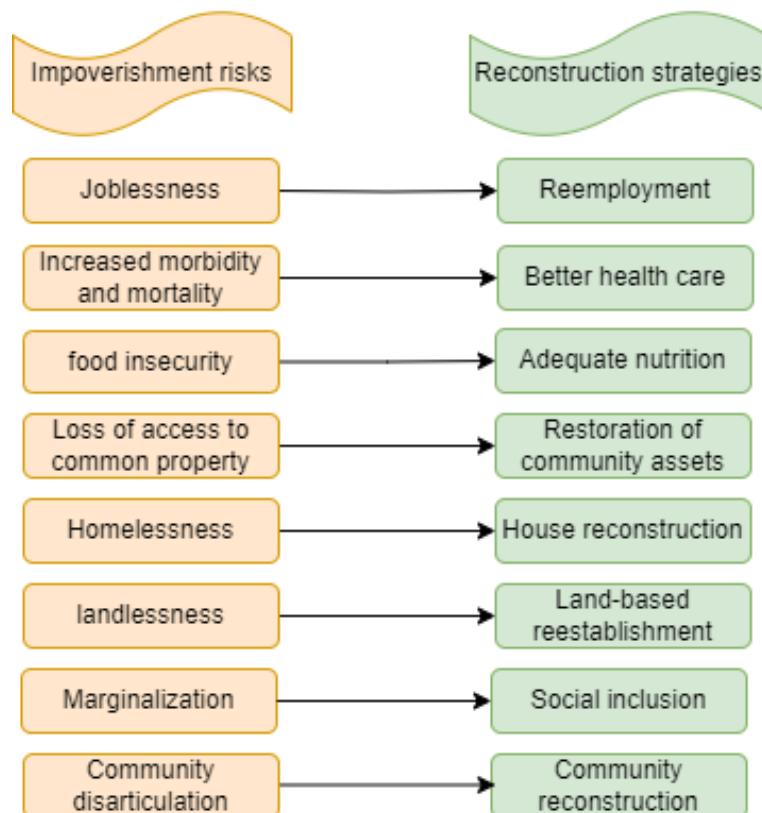
Resettled households attained well-being levels comparable to those of neighboring, non-displaced communities, and the community developed a sustainable local economy

integrated within the broader political and economic framework. The program's success is primarily due to proactive planning and a participatory relocation strategy that mitigated various barriers to successful resettlement. The organization's integrative approach, characterized by an in-depth understanding of displacement, facilitated conditions for households to reconstruct their social and material foundations. Furthermore, the economic recovery was achieved approximately 15 years after resettlement, following the identification of environmental and economic barriers to agricultural production by the resettlement organization (Stocks, 2014).

Sustainable livelihoods in the context of involuntary displacement

Numerous agencies and researchers have introduced multiple livelihood frameworks, including the impoverishment risks and reconstruction (IRR) model (Cernea, 1993), the sustainable livelihoods framework (Chambers & Conway, 1992), and the Sustainable Rural Livelihoods framework (Scoones, 1998). These frameworks examine the livelihoods of poor and vulnerable households concerning their assets, constraints, and capabilities while identifying the principal influence factors. The IRR model is often used in the context of development-induced displacement and resettlement (Cernea, 1993). It identifies key elements that represent the risks displaced populations face and the reconstruction strategies indicated in Figure 2.

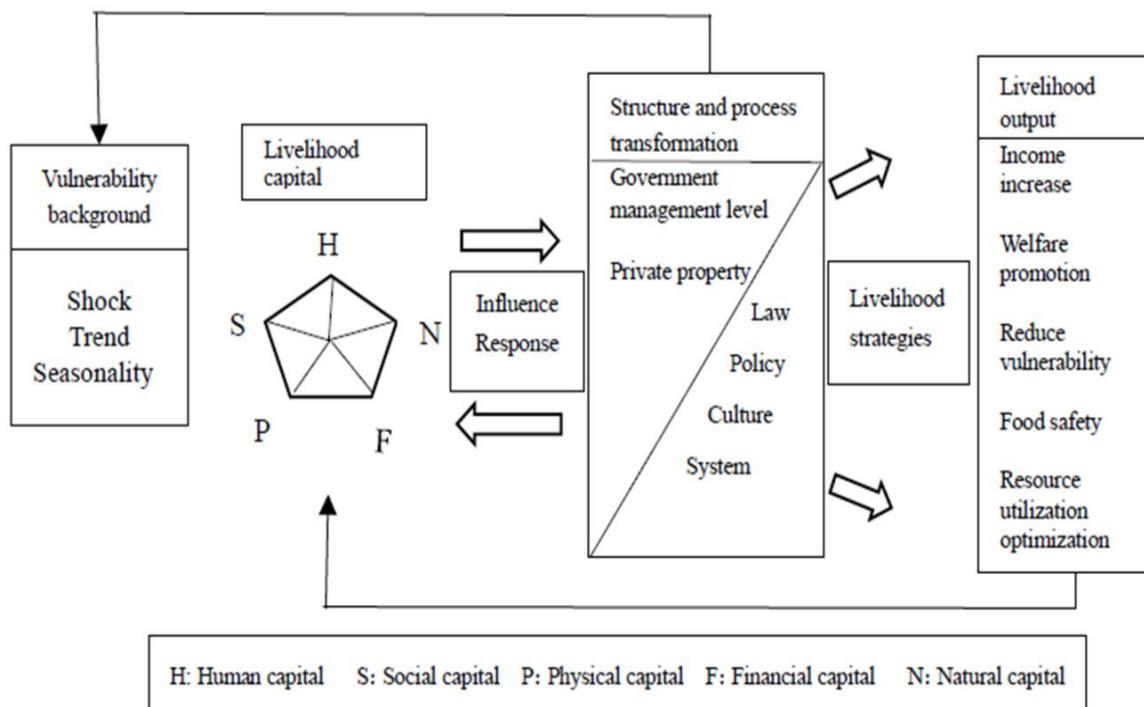
Figure 2: Impoverishment Risks and Reconstruction Model



The Sustainable Livelihoods Approach is essential for addressing involuntary displacement, as it systematically identifies individual needs and prioritizes development objectives (Department for International Development, 1999).

This framework in Figure 3 highlights the significance of macro-micro linkages by clarifying how policies, institutions, and governmental and non-governmental organizations affect individual lives and how individuals can, in turn, influence these structures.

Figure 3: Department for International Development's Sustainable Livelihood Framework

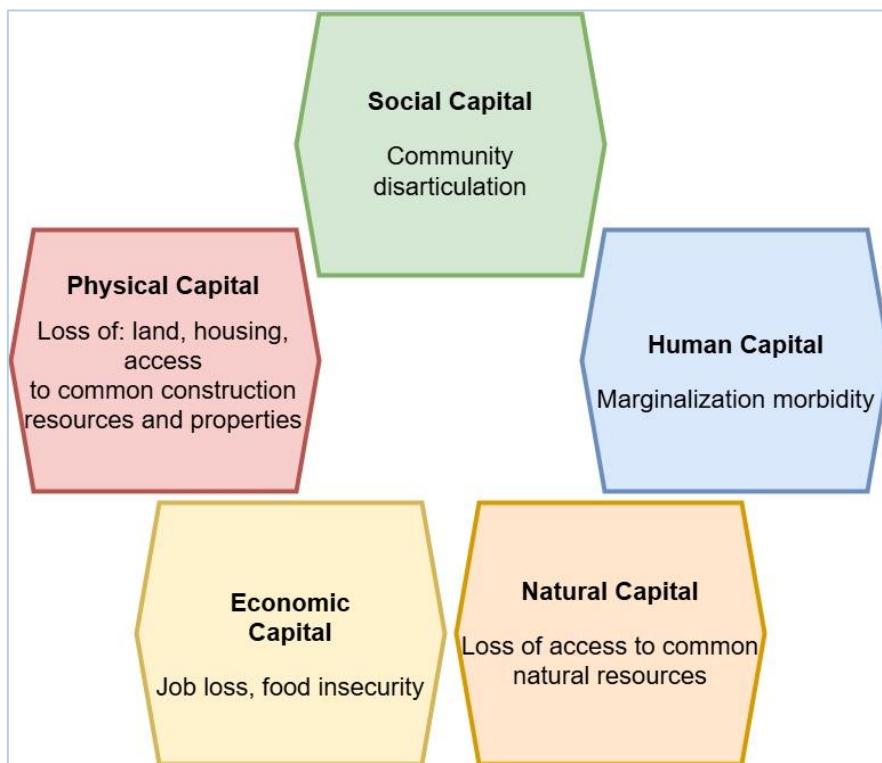


This approach is based on a thorough understanding of the various forms of capital available to communities and households. Integrating social, human, natural, economic, and physical capital allows communities to develop effective strategies for survival that reduce poverty, improve resilience to environmental shocks, and bolster social and political engagement. This conceptual framework demonstrates its applicability to contexts of involuntary displacement. (Chambers & Conway 1992; Department for International Development, 1999; Scoones, 1998)

Building on this framework, the Livelihoods Approach identifies which components of livelihoods are most critical to restore among involuntarily displaced populations. This prioritization highlights the need for targeted policy reforms, institutional adjustments, and mechanisms to support vulnerable groups in recovering essential livelihood resources. Policies aimed at poverty alleviation should correspond with the survival strategies utilized by impacted populations, both in the present and future, while preserving their current resource base.

Figure 4 illustrates a direct correlation between the Sustainable Livelihoods Approach capital and the displacement risks associated with impoverishment. Eight impoverishment risks are associated with the five Sustainable Livelihoods capitals, emphasizing the centrality of human and social capital as key focus areas.

Figure 4: Linking Sustainable Livelihood Capitals to Displacement-Related Impoverishment Risks



Note: Adapted from Ávila-Vargas (2020)

The interdependencies between capital mean impacts often overlap, influencing livelihoods holistically. Negative impacts on one form of capital can destabilize others, exacerbating poverty; in contrast, beneficial effects can create synergies that promote resource development. Individuals experiencing involuntary resettlement face disruptions to their daily lives and routines before, during, and after displacement, resulting in a systemic disadvantage in confronting these challenges and understanding the factors involved in the Sustainable Analysis of the population. Analyzing the aspects related to the capital within the population's Sustainable Livelihoods Approach and their connection to impoverishment risks facilitates the identification of the population's limitations and opportunities (Ávila-Vargas, 2021).

A higher number of assets within each capital correlates with reduced poverty levels. This relationship aids in effective planning for involuntary displacement and resettlement processes, facilitating the development of strategies to mitigate impoverishment risks and promoting the restoration of livelihoods at resettlement locations (Ávila-Vargas, 2020).

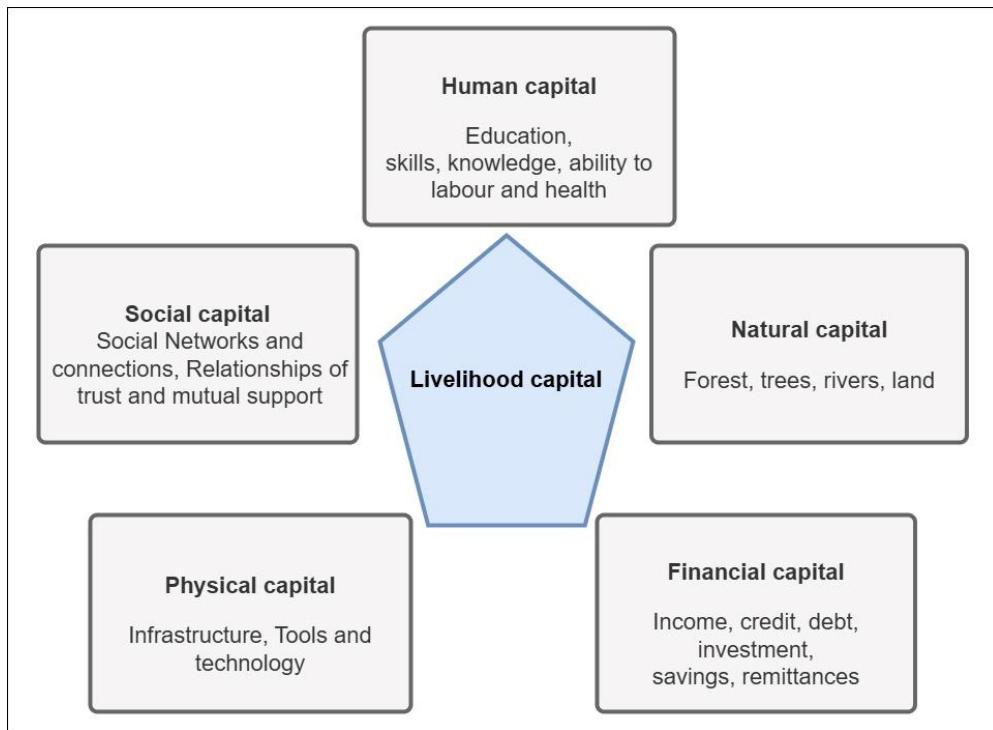
Development-induced relocation elucidates forced relocation and loss of assets and the forced displacement of communities obstructing development initiatives (Cernea, 1997). Data from development studies suggest that urban impoverishment results from unemployment, rapid urbanization, and the proliferation of urban development programs (Cernea, 1993; Oliver-Smith, 2009; Stanley, 2004; Yntiso, 2008). As a result, numerous impoverished urban residents who have been displaced are struggling to obtain a livelihood amidst adverse socioeconomic circumstances. Sustainable livelihoods for resettled households in urban areas have garnered increasing attention in development studies.

A livelihood is defined as 'income, both cash and in-kind, as well as the social institutions (e.g., family, compound, and village), gender relations, and poverty rights required to support and to sustain a given standard of living' (Ellis, 1998). Livelihoods also comprise the accessibility of public services like health, education, roads, and related infrastructure (Chimhowu & Hulme, 2006).

Ellis (2000) further stated that A livelihood comprises the assets (natural, physical, human, financial, and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household. This study adopts Ellis's definition of a livelihood. It suggests that individuals' assets, activities, and mediating processes can enable them to meet their basic needs and enhance their welfare.

Figure 5 identifies five core asset types of capital upon which livelihoods are built. For the research, we will consider, from the Sustainable Livelihoods Approach, the capital: human and social capital.

Figure 5: The Livelihood Framework



Note: Adapted from Ávila-Vargas (2021)

The daily life and way of life of people who are faced with involuntary displacement are disrupted, placing them at a disadvantage when facing the process. Unfortunately, it usually coincides with the population being displaced is left behind and, therefore, with an initial condition of poverty and extreme poverty, which is alarming, considering that by itself, the displacement process can place the population in disadvantaged situations and generate a new situation of poverty; where the existing poverty situation doubles, and gender social inequalities are accentuated, of which, incidentally, women tend to be more disadvantaged; therefore, when facing a process of involuntary displacement, it can be considered that its impact quadruples, drastically affecting the risks of the impoverishment of the population in general (Ávila-Vargas, 2021).

In the context of relocation, livelihood assets are closely associated with vulnerability through two paths: a lack of assets and diversity. In particular, families with fewer or less diverse assets are expected to be more vulnerable after the relocation (Chambers & Conway, 1992).

Social networks are essential for individual welfare, particularly during crises and economic shocks. The existence of informal social relations significantly reduces the probability of people experiencing poverty perceiving their household's economic or food security as vulnerable (Abdel-Moneim et al., 2021; Chou & Chow, 2009). Social networks can shield poor households against vulnerabilities and economic shocks. Informal support relations can lead to more sustained or organized patterns of collective action, especially when livelihoods and sources of income are threatened (Beall, 2004). In the context of urban relocation, social networks are necessary as an asset that resettled households can use to advance themselves or utilize for seeking jobs or income-earning opportunities to face the economic shocks after displacement.

Education is a crucial resource that can assist households in decreasing vulnerability. The results of Arun et al. (2010) indicated that human capital, such as education, is insufficient to reduce vulnerabilities and adverse economic shocks unless this translates into valuable, productive output. Education helps to enhance capacities that can help deal with adverse economic shocks, such as job loss, and create opportunities, such as self-employment, instead of readily available employment (Rakodi, 2002).

Additionally, age and gender are pertinent factors influencing employment and income gaps. (Chou & Chow, 2009; Hamdi, 2007; Ou & Pong, 2012; Tran, 2015) Gender-based labor force disparity has been related to differentials in employment rates and earnings compared to adult males. A study conducted by Tran (2015) revealed that individuals who migrate at a young age tend to be able to alleviate economic shocks and achieve superior financial performance compared to those who migrate at an older age. Hamdi (2007) found that transport costs and travel time for poor households have multiplied due to displacement and resettlement. Additionally, he discovered that earnings had been adversely impacted because females could not find jobs close to their residences and faced several economic shocks, causing their financial conditions to deteriorate.

Many development studies have approved the essential role of governmental support and subsidies in relocation programs (Amirthalingam & Lakshman, 2009; Hendriks, 2008; Tan et al., 2003). The lack of involvement of displaced households in selecting resettlement sites may heighten their reliance on the government and exacerbate challenges concerning livelihood outcomes post-resettlement (Tan et al., 2003). A study on planned resettlement in Zimbabwe revealed that the welfare and security of resettled impoverished households deteriorated as government support diminished. Resettled individuals who received support were often uneducated and lacked employable skills. The inadequate livelihood resources and restricted social networks significantly decreased the ability of these impoverished households to cope with economic shocks (Chimhowu & Hulme, 2006).

The resettled individuals are forced to utilize their resources and implement new adaptation strategies to sustain themselves and their families (Sanderson, 2000). Numerous urban impoverished individuals diversify their sources of income and use household members to increase their earnings, fulfill basic needs, and service their debts. When this transpires, family members extend their working hours, resulting in children either discontinuing their education or having diminished opportunities to complete their studies. Nevertheless, if the household's circumstances improve, they will continue enhancing their economic status and

security. Migration is crucial for securing income sources (Adger et al., 2002; Tran, 2015). In urban displacement, relocated households move to another area within the city or another city to diversify their income sources and fulfill basic needs (Abdel-Moneim et al., 2021).

Reducing expenditures is a familiar adaptation strategy that individuals employ to mitigate the effects of adverse economic shocks. Beall (2004) stated that the urban poor, particularly displaced families and migrants, use strategies such as altering consumption patterns (i.e., decreased family size, reduced food consumption, or limited expenditure) to cope with fluctuations in family income or economic disruptions, including price increases and the absence of subsidies. Research on urban adaptation strategies indicated that individuals reduce expenses by walking to work, consuming only one meal, and depending on self-medication (Ashmawy, 2020; Beall, 2004; Hamid, 1992; Harpham & Tanner, 1995).

Food security is one significant component of household livelihoods. Food security is a state where 'all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life' (USAID, 1992). Furthermore, Maxwell and Smith (1992) found that food security is not a principal objective for poor households. Research indicates that food constitutes merely one of several factors influencing the decision-making processes of impoverished households as they navigate their immediate and long-term survival needs. In its broadest sense, this study considers food security a crucial determinant of household livelihood outcomes.

In the Sustainable Livelihood framework, individuals are depicted as operating in a context of vulnerability (Chambers & Conway, 1992). Within this context, they have access to limited capital resources, which are used to implement a combination of livelihood adaptation strategies to achieve profitable and sustainable livelihood outcomes. This framework's institutional process (government and private sector) significantly enhances the capacity to accomplish these strategies and outcomes. In this study, we adapted the sustainable livelihoods framework to examine the economic shocks and livelihood adaptation strategies of households undergoing displacement and resettlement, as well as the impact of these strategies on the livelihood outcomes of these resettled households. The framework depicts individuals as residing in a context of adverse economic shocks that disrupt the financial resources of households following resettlement as a result of forced displacement. Given these circumstances, resettled households must strategically utilize their assets (education, job experience, and external resources) and adopt new adaptation strategies to provide for themselves and their families.

Strengths and weaknesses of the study

The sustainable Livelihoods Approach is an excellent tool to be considered by different countries for the planning of projects with development models that allow thinking about the well-being of the people and plan considering the origin of forced displacement and executing programs that respond to the recovery of the populations, thus considering different moments before, during, after (short, medium and long term) of the resettlement due to the significant impact and magnitude of the effects on people's lives.

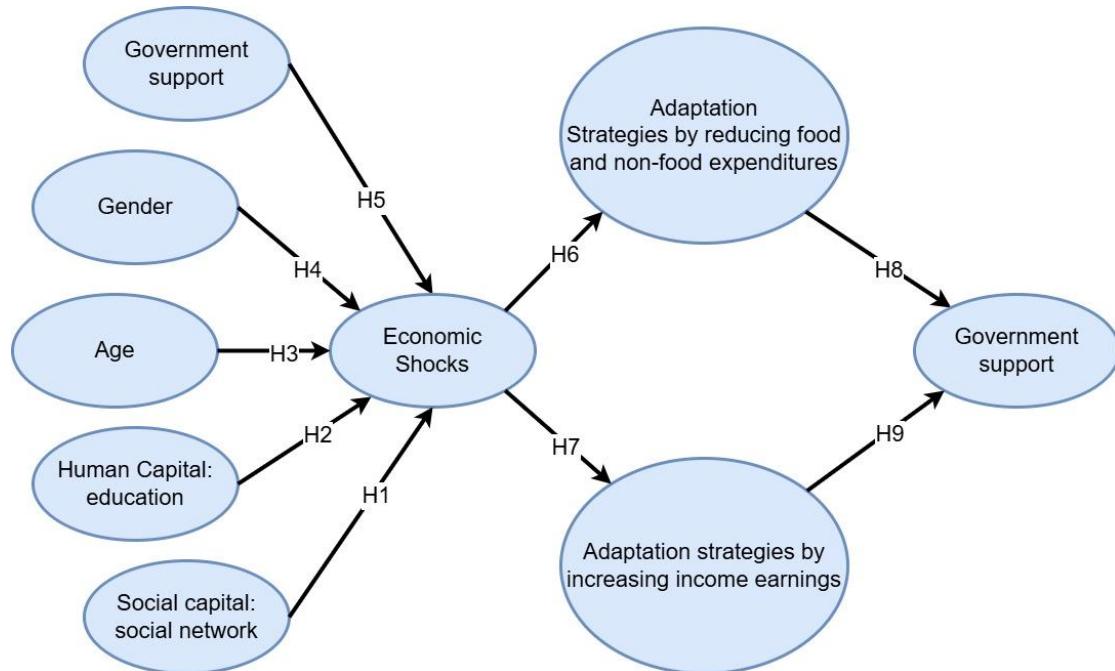
This paper will enhance the current literature on the livelihoods of resettled households by analyzing the combined effects of social capital, human capital, and external support. While research has examined the connections between human capital, social capital, external

support, and household livelihood, it has primarily concentrated on the direct associations of social capital, human capital, or external support with household livelihood outcomes. Few studies have investigated the combined effects of social capital, human capital, and external support on the livelihood outcomes of resettled households (Chou & Chow, 2009; Raza et al., 2013).

This study has some limitations. First, participants were self-selected into the study, so results could be biased by the subset of respondents who felt motivated to participate. Second, the study focused exclusively on examining the impact of the displacement and resettlement program on the livelihoods of relocated households in the Asmarat district. However, the government has established numerous other resettlement areas across various Egyptian governorates over the past decade. This limitation prevents the generalization of the study's findings to all resettlement areas in Egypt, as each governorate has distinct economic, social, and demographic characteristics. Future studies need to include multiple resettlement areas, capturing the variations and complexities of different regions. Researchers could develop more comprehensive insights into the nationwide effects of displacement and resettlement programs by considering a broader range of cases.

Hypotheses

Figure 6: Research Hypotheses



Hence, as shown in Figure 6, the following research hypotheses were tested as follows:

- H1: Social networks influence the household's experience of economic shocks.
- H2: The head's education influences the household's experience of economic shocks.
- H3: The age of the household head affects the household's experience of economic shocks.
- H4: The gender of the household head affects the household's experience of economic shocks.

- H5: Governmental support influences the household's experience of economic shocks.
- H6: The experience of economic shocks within a household affects its adaptation strategies by reducing food and non-food expenditures.
- H7: The experience of economic shocks by a household affects its adaptation strategies by increasing income earnings.
- H8: The adaptation strategies that involve reducing spending on food and non-food expenditures affect household livelihood outcomes significantly.
- H9: The adaptation strategies by increasing income earnings influence the household's livelihood outcomes.

Methodology

Data analysis was performed utilizing 24.0 V of SPSS 24.0. This study utilizes structural equation modeling (SEM) as the principal analytical approach, employing the SMARTPLS 4.0 software. The coefficients in SEM were estimated using the maximum likelihood estimation (MLE) method. Maximum Likelihood Estimation is an iterative method aimed at maximizing the probability that the obtained values of the criterion variable are accurately predicted, in contrast to ordinary least squares (OLS), which minimizes the squared deviations between the criterion variable values and the model's predictions (Olivares & Forero, 2010).

SEM encompasses two significant aspects of the analysis process. The causal processes among the variables under investigation are presented through a series of simultaneous regression equations for each dependent and intermediate variable. These variables are incorporated into the model only to the extent that they can be interpreted as theoretically justifiable causal relationships. This method provides enhanced flexibility regarding statistical assumptions. This feature sets SEM apart from techniques that accommodate multiple dependent variables, such as multivariate analysis of variance and canonical correlation analysis, as these procedures allow only a single relationship between dependent and independent variables. Furthermore, SEM can model relationships involving measurement errors and direct and mediated effects, offering alternative assessments of construct validity and reliability (Kaplan, 2009). Secondly, these structural relations can be illustrated visually to enhance conceptual clarity and facilitate examination.

The proposed model can be statistically tested by analyzing the complete variable system to assess its consistency with the data. A good-fit path model indicates the degree to which it aligns with a given set of observations in the data. Fit indices effectively summarize the differences between observed values and those anticipated by a statistical model (Olivares & Forero, 2010). The estimated model's squared multiple correlations (R^2) indicate the extent to which independent variables predict dependent variables and the strength of the hypothesized relationships between them. The model's factor loadings indicate how much an independent variable influences a dependent variable, specifically quantifying the change in the dependent variable corresponding to one standard deviation or unit change in the independent variable. In SEM studies, variables are categorized into exogenous variables, like independent and endogenous variables, which serve as dependent, intermediate, or outcome variables (Hoyle, 2012). The following mathematical model represents the structural equation:

$$y = B y + \Gamma x + \zeta$$

In those:

y observed endogenous variable matrix ($p \times 1$)
 x observed exogenous variable matrix ($q \times 1$)
 B (beta) endogenous regression matrix ($p \times p$)
 Γ (gamma) exogenous-endo regression matrix ($p \times q$)
 ζ (zeta) residuals/ disturbances vector ($p \times 1$)

The overall objective of the study is to determine the variables influencing the Households' livelihood outcomes in the Asmarat district through:

1. Identifying the effect of social and human capital interactions on Households' exposure to economic shocks caused by forced relocation.
2. Examining how the adverse economic shocks after resettlement from 2014 to 2024 affect the Households' livelihood adaptation strategies to deal with these economic shocks.
3. Investigating the effect of the different livelihood adaptation strategies on Households' livelihood outcomes after resettlement in the Asmarat district. More specifically, we focus only on analyzing some social and human capital interactions, two categories of all capital.

This study proposes a model comprising five exogenous variables: gender, age, education, changes in income after 10 years of resettlement, and governmental support. The intermediate variables include economic shocks and adaptation strategies. Additionally, one dependent variable is the life satisfaction of respondents.

Methodological design

Questionnaire development

The survey included two sections: one focused on demographic details such as age, education, gender, occupation, and income.

The questionnaire used in the research was developed by carrying out the following actions:

- Review of demographic surveys applied in previous studies: Data collection involved the adoption of question statements from prior studies (Beall, 2004; Tran, 2015). Review of interdisciplinary methodologies: The survey included two sections: one focused on demographic details such as age, education, gender, occupation, and income. In the second section, an interdisciplinary approach was utilized, consistent with methodologies found in relevant literature. The survey incorporated questions regarding governmental support, social networks, livelihood adaptation strategies, adverse economic shocks, and respondents' ability to meet household food security and basic household needs. This section required responses on a 3-point Likert scale, indicating a continuum from very negative to very positive
- Consult experts: Three experts in the relevant fields assessed the question statements to improve their effectiveness, relevance, and clarity.

- Pilot test: The questionnaire was tested to verify its relevance and reliability for the study's objectives. The style and language of the questions were analyzed to enhance participant comprehension. This pilot study involved distributing 35 questionnaires to residents of the Asmarat district. Their feedback primarily addressed inadequate formatting and improper phrasing in specific questions. Consequently, modifications were implemented to enhance the understanding of the survey questionnaire.

Data collection

The sampling frame targeted residents of the Asmarat district. The questionnaire was administered to a random sample of 693 individuals in 2024. This sample size allows a confidence interval of 95% and a margin of error of 6%, with participants voluntarily agreeing to participate in the study. Participants were approached on the streets or at their apartments in the district and requested to complete the questionnaire following approval from the head of the Asmarat district. The questionnaire responses were subsequently coded to ensure participant anonymity and analyzed statistically utilizing SPSS version 19 software and the SMARTPLS 4.0 program.

Ethical approval

The study received approval from the Demography Statistics and Population Department at Cairo University. Furthermore, the authors secured approval from the Asmarat district management unit and the Central Agency for Public Mobilization and Statistics of Egypt (CAPMAS) to utilize the data before analysis. Participants provided consent at the start of the survey. Subjects received a briefing on the study's aims and fundamental concepts before distributing the questionnaire to prevent ambiguity or misinterpretation. Participants retain the right to withdraw from the research at any point.

The research process adhered to the ethical guidelines established by the British Educational Research Association (2018) and the British Psychological Society (2018), ensuring anonymity and confidentiality. This report utilizes the data anonymously. Data were stored electronically, with personal information excluded before analysis by the lead researcher. A dataset devoid of personal information was exclusively shared with the other team members for evaluation and interpretation. Anonymity and confidentiality have been maintained throughout data collection, sharing, analysis, and presentation. This ethical consideration will be adhered to in any subsequent data utilization.

Results

Descriptive analysis

Table 1 displays the socioeconomic characteristics of the heads of households in the sample. The research shows us an interesting general fact that of the total population studied (693), in terms of the socioeconomic characteristics of the heads of household, a majority (58.2%) of heads of household according to the study are women, where at the same time 48.5% are in the 18 to 30-year-old group and 54.3% of the bosses had no education, which displays a result

based on a vision of women and their reality to generate survival strategies in urban housing resettlements.

Table 1: Socioeconomic Characteristics of the Heads of Households in the Sample

Characteristic	Frequency n	Percentage %
Head's gender		
Male	290	41.8
Female	403	58.2
Head's age		
18–30	336	48.5
31–50	237	34.2
> 50	120	17.3
Head's education		
No school	376	54.3
Primary	158	22.8
Secondary	98	14.2
Higher	61	8.6
The perceived significance of governmental Support		
Did not receive at all	247	45.1
Slight significant	312	19.2
Very significant	134	35.7
Social networks		
Limited relationships	299	43.2
Medium relationships	131	18.9
Extensive relationships	263	37.9
Strength of economic shocks		
Weak economic shocks	92	13.1
Moderate economic shocks	389	56.2
Strong economic shocks	212	30.7
Times of reducing non-food expenditure during the past month		
1–3	235	33.9
4–10	312	45.1
More than 10	146	20.9
Times of reducing food expenditure during past month		
1–3	213	30.8
4–10	300	43.3
More than 10	180	25.9
Times of getting help from relatives or friends during the past month		
1–3	202	29.2
4–10	329	47.5
More than 10	162	23.3
Number of household's income sources		
1	396	57.2
2	193	27.9
3	104	14.9
Times of temporary migration for a new economic activity during the past year		
1–3	417	60.2
4–10	179	25.9
More than 10	97	13.9

Characteristic	Frequency n	Percentage %
Household's food security		
High food security	285	41.2
Medium food security	183	26.4
Low food security	225	32.4
Degree of affordability of basic needs		
High affordability	87	12.5
Medium affordability	272	39.3
Low affordability	334	48.2
Total	693	100

Regarding the impact of governmental support on the household's livelihood, 45.1% of the households studied did not receive any governmental support, and 35.7% view the role of government assistance as extremely important and impactful in addressing their needs and improving their livelihoods. Furthermore, 43.2% of the people surveyed reported having limited social relationships, and 37.9% reported having extensive relationships. This indicates that women do not consider government support appropriate to obtain improvements in their homes, and, on the other hand, social networks were not helpful for the majority due to the limited relationships they represent.

After resettlement, economic shocks were strongly experienced by 56.2% of those surveyed. It was even found that in January of the year 2023, 45.1% of those surveyed had to reduce their non-food expenses between 4 and 10 times, 43.3% reduced their food expenses between 4 and 10 times, and 47.5% asked family or friends for help approximately 4 to 10 times.

The number of sources of household income indicated that 57.2% of the households studied have one source of income, while 27.9% have two. They also suggest that 60.2% of respondents had to migrate to another city between one and three times during 2023, while 13.9% had to migrate more than 10 times for a new economic activity. Regarding the household's food security, 41.2% of respondents reported high food security, while 32.4% reported low food security. On the other hand, the degree of affordability of basic needs, 48.2% of respondents reported that they have a low ability to afford the basic needs of their homes. In comparison, only 12.5% have a high ability to afford basic needs.

Measurement model analysis

The study sample comprised 693 completed questionnaires analyzed using the SEM technique. The first step of the SEM analysis involved evaluating the significance and magnitude of the factor loading for all construct items within the measurement model. Indicators with loadings of ≥ 0.50 that are statistically significant are considered relevant (Olivares & Forero, 2010). Therefore, Table 2 shows that the factor loadings for all construct items exceed the recommended threshold of 0.50. The reliability of the constructs was assessed utilizing Cronbach's Alpha (α) and composite reliability (CR) criteria (Hoyle, 2012). The values of α CR exceed the recommended threshold of 0.7 for all constructs, suggesting an adequate degree of reliability (Hoyle, 2012). AVE exceeded 0.50, confirming that all constructs met the acceptable convergent validity threshold (Olivares & Forero, 2010).

Table 2: Reliability of the Construct's Measurements

Construct	Item	Factor loading	α	CR	AVE
Adaptation strategies by reducing spending and getting help	Get help	0.983	0.964	0.977	0.933
	Reduce non-food expenditure	0.973			
	Reduce food expenditure	0.941			
Adaptation strategies by increasing earnings	Income sources	0.948	0.991	0.996	0.991
	Migration	0.937			
Livelihood outcomes	Food security	0.953	0.900	0.952	0.909
	Affordability of basic needs	0.954			

Note: (α)= Cronbach's Alpha; CR = composite reliability; (AVE) = average variance extracted.

Before a comprehensive evaluation of the proposed model, we verified that it has an overall good fit, as the goodness of fit indicators met the levels suggested in the literature. Table 3 summarizes the fit indices for the structural equation model assessing household livelihood outcomes.

Table 3: Fit Indices of the Model

Fit Index	Value	Recommended Level for the perfect fit	Fit
SRMR	0.072	SRMR \leq 0.08	Accepted
NFI	0.962	NFI $>$ 0.90	Accepted

The Standardized Root Mean Square Residual (SRMR) results indicate that the model demonstrates a good fit. The SRMR is 0.072, below the recommended threshold of 0.08 (Meyers et al., 2013). The model's Normed Fit Index (NFI) is 0.962, exceeding the threshold of 0.90, indicating a good fit with the data (Meyers et al., 2013). The revised model demonstrates a significantly improved goodness of fit, effectively demonstrating the impacts of independent and intermediate variables on household livelihood outcomes post-resettlement.

Structural model

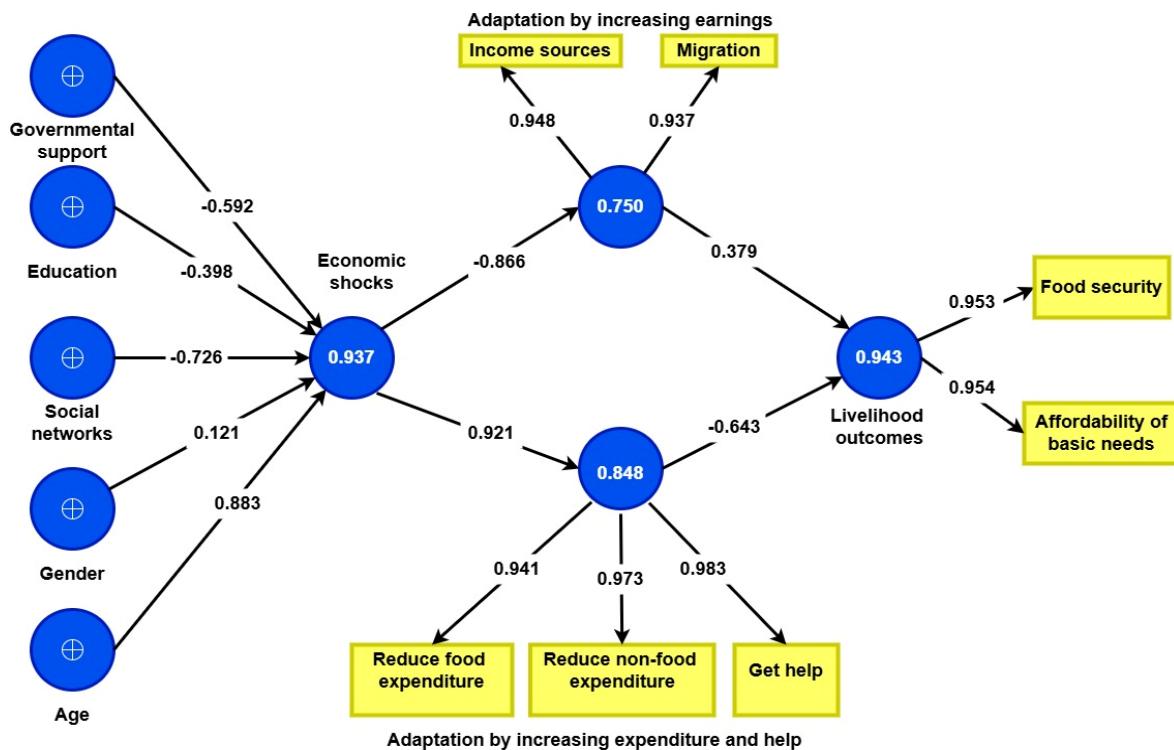
In structural equation modeling analysis, R-squared shows the variance explained by the model. The study results indicate that economic shocks can be explained by the head's age, education, gender, social networks, and governmental support, with an R-squared value of 0.937. Furthermore, economic shocks account for 75% of the livelihood adaptation strategies by increasing earnings and about 85% by reducing spending and getting help. The livelihood adaptation strategies that involve reducing expenditures, getting help, and increasing earnings account for approximately 94% of the household's livelihood outcomes.

The findings reveal that the head's age ($\beta= 0.883, p = .000$) and gender ($\beta= 0.121, p = .005$) statistically impact the economic shocks. The results reveal that social networks ($\beta= -0.726, p = .000$), governmental support ($\beta= -0.592, p = .000$), and the head's education ($\beta= -0.398, p = .000$) have a statistically significant negative impact on the economic shocks. The effect of economic shocks can be ranked in the following order: age of the head of household, social networks, governmental support, education of the head, and gender.

Table 4: Summary of Hypothesis Testing Results

Path	Standard estimate	Standard deviation	t value	p value	Result
Age -> Economic shocks	0.883	0.069	12.756	.000	Supported
gender -> Economic shocks	0.121	0.043	2.789	.005	Supported
Education -> Economic shocks	-0.398	0.052	7.625	.000	Supported
Social networks -> Economic shocks	-0.726	0.044	16.336	.000	Supported
governmental support -> Economic shocks	-0.592	0.031	18.972	.000	Supported
Economic shocks -> Adaptation by reducing spending and getting help	0.921	0.032	17.254	.000	Supported
Economic shocks -> adaptation by increasing earnings	-0.866	0.018	15.559	.000	Supported
adaptation by increasing earnings -> Livelihood outcomes	0.379	0.019	19.533	.000	Supported
Adaptation by reducing spending and getting help -> Livelihood outcomes	-0.643	0.019	17.452	.000	Supported

Note: R-square: economic shocks = 0.937; adaptation strategies by reducing spending and getting help = 0.848; adaptation strategies by increasing earnings = 0.750; livelihoods outcomes = 0.943

Figure 7: The Model of Variables Affecting Household Livelihood Outcomes

Moreover, the relationship between economic shocks and adaptation strategies through reduced expenditures and getting help is positive and statistically significant ($\beta= 0.921, p = .000$). In contrast, the effect on adaptation strategies through increased earnings is statistically negative ($\beta= -0.866, p = .000$).

The findings demonstrate that adaptation strategies involving reduced expenditures and help have a statistically significant negative impact on household livelihood outcomes ($\beta = -0.643$, $p = .000$). Conversely, adaptation strategies aimed at increasing earnings exhibit a significant positive effect on household livelihood outcomes ($\beta = 0.379$, $p = .000$). The model of variables affecting household livelihood outcomes generated by SEM is shown in Figure 7; the summary of hypothesis testing results is provided in Table 4.

Discussion

Researchers have found that livelihood adaptation strategies are essential for relocated households in adapting to new living conditions and addressing negative economic impacts resulting from forced relocation. Ellis (1998) demonstrated that strategies, available choices, and assets influence a household's response to economic shocks. A livelihood strategy refers to selecting and organizing the choices individuals or groups make. Livelihoods rely on more than just economic capital; they also depend on other forms of capital, such as social (networks and relationships), human (education and health), natural (land and resources), and physical (infrastructure). Addressing these interconnected elements ensures a more resilient and balanced recovery (Alinovi et al., 2010).

The findings generally indicate that human capital, determined by the educational level of displaced people, demonstrates the intended effect of economic crises. The educational level of the household head is inversely correlated with the negative economic shocks experienced during relocation and resettlement. Resettled households depend more on social networks than on their education levels. The education acquired by people resettled in their region of origin may not be recognized in the resettlement area. As a result, most were employed in low-skilled positions, including service and sanitation roles. The results are inconsistent with the findings of previous research by Tran (2015), which suggested that the educational level of the chief has no impact on post-resettlement economic shocks.

It was determined that the age of the head of the household positively influences the household's experience in the face of economic crises. Relocated seniors often face challenges managing economic disruptions and adapting to a new lifestyle. For example, a respondent stated,

"I am 78 years old and have no source of income other than the monthly support provided by the government, which barely allows me to survive here in Al-Asmarat. I wish I could return to my old neighborhood in Manshiyat Nasser."

Consequently, providing guidance on job applications and offering comprehensive skills training could represent a positive development. The male head of the household significantly influenced the economic crises experienced by resettled households. The findings corroborate previous studies indicating that men possess a superior capacity to mitigate economic shocks, as they are more advantaged in accessing employment and income opportunities compared to women (Abdelkader et al., 2022; Abdel-Moneim et al., 2021; Ashmawy, 2020).

Women are more likely to concentrate on a narrow range of occupations that offer lower wages. The distance between the resettlement site and the original site and job opportunities pose a barrier to maintaining previous sources of income (Cernea, 1993). Displacement

frequently results in loss of employment for women employed as servants. Due to the absence of nearby employment opportunities after resettlement, people are forced to travel considerable distances, often spending more than half their income on transportation to their workplaces.

The findings also highlighted the importance of governmental support programs. The findings indicate that government support programs have influenced households' experiences in the face of negative economic crises. The greater the assistance and support received from the government, the fewer the economic shocks the household experiences after displacement. The government's ability to recognize the needs of displaced people and assist them in rebuilding their livelihoods is of utmost importance. This finding is consistent with previous evidence highlighting the importance of government support in providing stability, especially in times of transition, such as during resettlement or recovery from economic shocks (Chimhowu & Hulme, 2006). Our analysis of the types of government support indicates that the most common forms of assistance resettled people receive after relocation include the issuance of official documents (such as birth certificates and identification cards), the provision of job training programs, monetary assistance, and the dissemination of information about job opportunities.

The investigation shows that a greater frequency of social network interactions within a household correlates with a reduced incidence of economic shocks. This finding aligns with previous evidence, indicating that informal social relations significantly reduce the likelihood of poor resettled households experiencing economic shocks (Chou & Chow, 2009).

Social assistance programs are essential for relocated households to foster social cohesion in resettlement sites (Abdelkader et al., 2022; Hwang et al., 2011). The result obtained allows an opportunity for improvement for governments where education could be generated on the usefulness of social networks for psychological support and accompaniment among families, mainly in the first stages of resettlement where they are vulnerable with multiple feelings of loss of their familiar environment and uncertainty in the new environment by establishing connections with new settlement environments and welcoming neighbors and improving the social capital of residents in resettlement areas. One respondent summarized the impact of social networks, "When I moved to the Al-Asmarat neighborhood, I moved along with all my family and neighbors. Here, we help each other whenever we face problems or crises."

The main problem associated with urban displacement and relocation due to economic crises is not the loss of housing but rather the loss of employment or sources of income tied to specific locations, increased costs of living, and the uncertainty of finding new jobs in the resettlement area. For example, a respondent stated,

"I am uneducated, and I used to work in garbage collection in my old neighborhood. My income was sufficient because I didn't have to pay rent or bills. However, after moving to Al-Asmarat, my income is no longer enough to meet my needs due to the cost of rent and bills, so I often have to borrow money from my friends."

Households in the Asmarat district earn income from businesses linked to their former residences, such as selling in the market or collecting waste. However, these activities are prohibited at the resettlement site, resulting in increased transportation costs due to the need to use multiple modes of transportation to access their previous locations. The projects available for work within the Asmarat district show low returns. Consequently, resettled

households cannot cover the new formal living expenses, as these differ significantly from their previous circumstances in the informal settlements. Rent is considered a financial burden for resettled households, particularly due to the instability of their income sources. Additionally, some residents cannot access electricity services because they cannot afford to pay for electricity. This finding is consistent with previous evidence indicating that relocation increases household vulnerability (Parsons et al., 2016).

Therefore, adaptation strategies to address economic shocks are essential for understanding the overall livelihood outcomes of households after relocation. The results indicate that resettled households employed strategies to increase income and decrease spending to adapt to negative economic shocks. The adaptation strategy of increasing income has effectively improved household livelihood outcomes, specifically regarding food security and the affordability of basic needs. A respondent stated, "My income here in the neighborhood is not enough, and at times, I am forced to travel to other governorates to earn a higher income to meet my family's needs."

Adaptation strategies that involved reducing expenditures negatively affected the livelihood outcomes of resettled households. This finding contradicts numerous studies on livelihood adaptation strategies, which indicate that impoverished families, particularly migrants, employ strategies such as adjusting spending patterns by reducing expenditures on healthcare and food (Ashmawy, 2020; Beall, 2004; Harpham & Tanner, 1995; Takeuchi et al., 2008).

The positive impact observed suggests that increased earnings improve household livelihood outcomes, supporting the ninth hypothesis. This finding aligns with the notion that livelihood diversification correlates with a gradual improvement in livelihood outcomes (Adger et al., 2002; Ellis & Freeman, 2004; Méndez-Lemus, 2012). The results suggest that the relocation program resulted in a considerable increase in living costs, which represented a substantial financial burden and presented a significant challenge to the relocated population (Abdelkader et al., 2022; Hwang et al., 2011; Takeuchi et al., 2008). After resettlement, households often expand their sources of income to restore their livelihoods. Resettled people seek to diversify their income sources to mitigate prolonged unemployment and other economic crises. Consequently, a decrease in income from one source can be offset by income from an alternative source (Ashmawy, 2020).

Conclusions and recommendations

Studies on household livelihoods, particularly among resettled households, have been limited due to insufficient data availability in Egypt.

The livelihoods approach represents an opportunity for public policymakers, project formulators, and urban travel planners.

Those resettled where the heads of households are mostly women showed the capacity to reestablish their livelihoods, mainly due to the significant relationship between the influence of available assets and economic strategies.

The capacity of resettled households to recover in impoverished contexts by relying on their social capital requires actively working to reestablish connections between resettled

individuals and their new environments. Emphasizing social capital development is essential as a foundation for sustainable resettlement outcomes.

Government subsidies after resettlement are significant in recovering from economic shocks, investing in diverse economic strategies, and shaping the livelihood outcomes of displaced individuals. The consistent provision of governmental subsidies and employment guidance plays a crucial role in ensuring the long-term success of resettlement programs by addressing immediate needs and fostering economic independence.

The ability to restore families' livelihoods in conditions of poverty and economic instability requires planning for resettlement alternatives linked to economic capital that affect other capitals, and families can generate a diversity of strategies that allow them to adapt to the new living conditions.

More research is required on the prevalence of livelihood problems and their determinants within the community, making it imperative to conduct an interview considering information on the livelihoods of people who will be exposed to a resettlement process before, during, and after being resettled in a way that allows identifying, analyzing and evaluating the various connections between capitals and how these influence the livelihoods of the resettled and guiding interventions at different times according to the impacts.

The study suggests implementing systems to track the effectiveness of livelihood strategies adopted by resettled households and refine approaches based on their specific needs and challenges.

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