

# Poverty in Egypt, Abominable but Tenuous. Understanding and Eradicating Poverty in the Arab Republic of Egypt: A Comprehensive Analysis of Economic, Social and Nutritional Factors

Sarah Diao ElDin Moustafa<sup>1\*</sup>, Doaa Salman Abdou<sup>2</sup>, Marwa El Sherif<sup>3</sup>

<sup>1</sup>Graduate Teaching Assistant in Financial Management and Accounting

<sup>2</sup>Professor of Economics

<sup>3</sup>Associate Professor of Economics

**\*Corresponding Author:** Sarah Diao ElDin Moustafa, Graduate Teaching Assistant in Financial Management and Accounting

**ORCID:** 0009-0004-9553-364X

## ABSTRACT

To halt poverty in all its forms everywhere – This paper presents a comprehensive analysis of the drivers of poverty in the Arab Republic of Egypt over a 15-year period, with a focus on the economic, social and nutritional factors that contribute to this matter of issue. The study emphasizes the need for a wider range of assessment beyond just economic terms in order to fully understand and effectively address poverty. By covering geographically excluded areas and gathering a fuller range of information, the paper aims to provide an indispensable tool for policymakers and stakeholders to develop strategies that can help vulnerable populations, eradicate poverty, protect the country's economy against downturns, and sustain its growth and development. Ultimately, this study contributes to a better understanding of poverty in the Arab Republic of Egypt and lays the groundwork for effective poverty reduction efforts.

**Keywords:** Arab Republic of Egypt, Poverty, Development, Growth, Health, Employment, Population.

**JEL codes:** O11, O15, I15, J21, J11, O53, O57

## INTRODUCTION

In this paper, facts from official sources are presented and analysed to try to align with Egypt's 2030 vision and the United Nations organisation's (UN) Sustainable Development Goals (SDGs) to evade the increasing or rather stagnant number of poor and vulnerable people in the country.

This paper will look at the various dimensions that predominantly affect poverty in Egypt across the republic's governorates through a study that covers the period between the years 2006 and till 2021.

### The International Day for the Eradication of Poverty!

Through resolution 47/196; which was adopted on the 22nd of December 1992, the General Assembly declared the 17th of October as the International Day for the Eradication of Poverty. (UN, 2020). Just as the declaration of the poverty

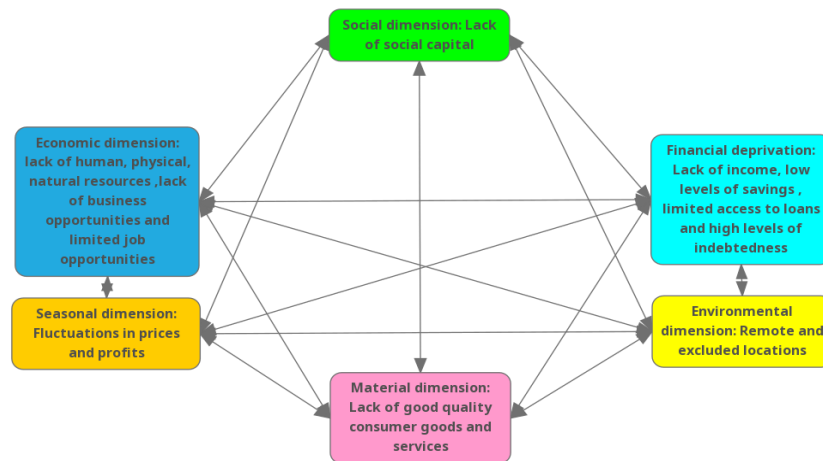
eradication international day. Initiatives for ending poverty emerged by countries with resources that make eradicating poverty feasible. (Martin Ravallion, Edmond D. Villani, 2020)

In 1990, it was estimated that 2 billion people were below the extreme poverty line representing 38% of the world population at the time. Poverty was reduced during the MDGs time plan between 2000 and 2015, due to global joint efforts; in fact, the goal to reduce extreme poverty by half was achieved in 2011. In 2019, 660 million people were suffering from extreme poverty representing 8.5% of the world population. In 2020, that number increased and was estimated to be at 733 million. (Zach Christensen, 2023)

Overcoming these costly challenges will require tremendous effort by policymakers and institutions. But by implementing widespread and strategic policies and following them through, Egypt has the potential to bring reforming results. (David K. Bohl, et. al, 2018)

## LITERATURE REVIEW

### Multidimensional Poverty



**Diagram1.** Web of multiple dimensions of poverty

Adopted from (Gweshengwe, 2020) and modified by the (\*\*Author, 2023)

Diagram edit was done by the author using the software mindmup<https://app.mindmup.com/>

Derived from the diagram above, Poverty comes in an intertwined and complex nature; which introduces an inevitable multidimensional view for analysing it. In addition to that aspect, individual characteristics and specific features of poverty itself reflect the variation in the intensity of it; depending on age, gender and the on hand situation.

Insights about poverty, whether it's absolute or relative, is essential for policy makers and stakeholders to be able to fully grasp and control it.

Duly many studies agreed on the multidimensional feature of deprivation ranging from financial, economic, social, political, health, to environmental and seasonal, all these features dejectedly complement each other (Ali-Akpajiak & Pyke, 2003; Bourguignon & Chakravarty, 2003; Chambers, 1981, 1983, 1995, 2012; Devereux et al., 2012; Hick, 2016). Where;

Financial dimension of poverty: refers to a lack or scarcity of income or having an income below a country's minimum wage or set income-poverty line.

Economic dimension of poverty: refers to a lack or scarcity of resources needed to afford an acceptable standard of living and be able to attain basic needs (G. F. R. Ellis, 1984; (Swedish International Development Cooperation Agency (SIDA), 2017). These resources include land,

clean air and water, forestry products, fishery stock, infrastructure (Roads, buildings, markets and communication systems), production goods such as machinery and tools; and human capital like having proper education, labour market demanded skills and experience and good health (Brand,2002; F. Ellis, 2000; SIDA,2017). Economic deprivation also refers to low levels of employment or gaining low wages and at times not fixed nor secured jobs. (Hulme& McKay, 2007)

Material dimension of poverty: Which is directly related to the living conditions of individuals and households (Terraneo, 2017).It entails scarcity of acceptable quality of consumer goods and services. (Chambers, 2006, 2012; Gordon, 2010; Kus et al., 2016; Townsend, 1979, 1987)

Social dimension of poverty: refers to a lack or scarcity of social capital (G. F. R. Ellis, 1984); which is linked to social control and networks that supports and secures benefits and gains. (Bartkus& Davis, 2009; Brand, 2002; Ostrom, 2009; Portes, 1998)

Seasonal dimension of poverty: (Chambers, 2012), stated that poverty has upwards, downwards and stable trends that are reflected in other features and can affect how strongly they intertwine. (Chambers, 1979, 1981, 1995, 2012; Devereux et al., 2012)

Health dimension of poverty: refers to ill health and lack of access to quality health care. (Chen &

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Pan, 2019; Clarke & Erreygers, 2019; Combat Poverty Agency, 2004; Simon D., 2013) Which includes high levels of health deterioration contexts such as malnutrition, low life expectancy, high exposure to diseases, and being left out in regards to access to health-care services. (Blessing Gweshengwe & Noor Hasharina Hassan, Xuejun Duan, 2020)

Poverty is traditionally analysed through income, basic needs and capabilities. (Gweshengwe and Hassan, 2019).

### The Poverty Cycle

Low income could cause material deprivation, loss of social capital, and economic resources, which could intensify the financial deprivation. (Blessing Gweshengwe & Noor Hasharina Hassan, Xuejun Duan, 2020)

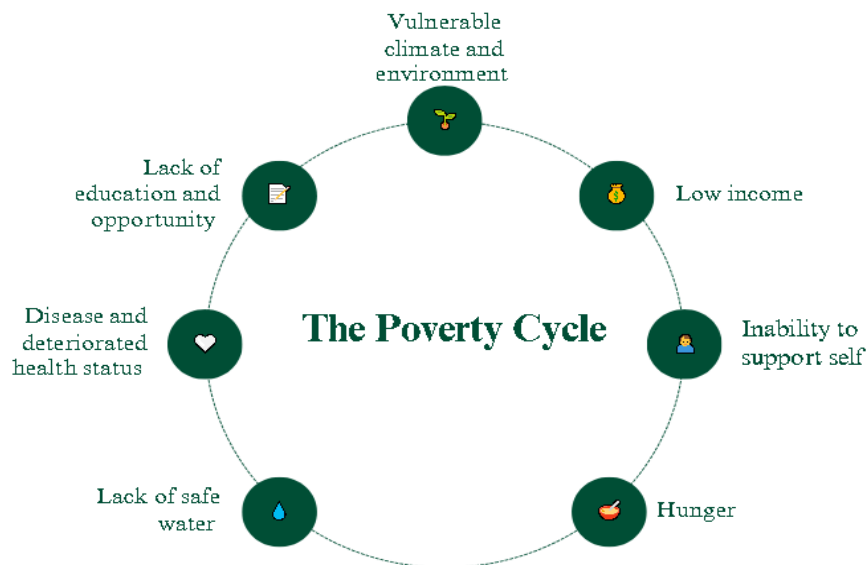


Diagram2. Vicious spiral of poverty

Adopted from (Penny appeals report, 2020) and modified by the (\*\*Author, 2023)

Diagram modification done through the Canva Graphic design company's website <https://www.canva.com/>

Vicious spiral of poverty and deprivation can move from one generation to the next. Diagram (2) demonstrates how the 'vicious spiral of poverty' is built up of intertwined factors, such as limited access to quality health care systems and

lack of good education, which complicates the process of cutting off poverty and stops it from congenitally being inherited through upcoming generations. (Penny appeal, 2020)

### Poverty and Associated Risk Coupled with Inequality

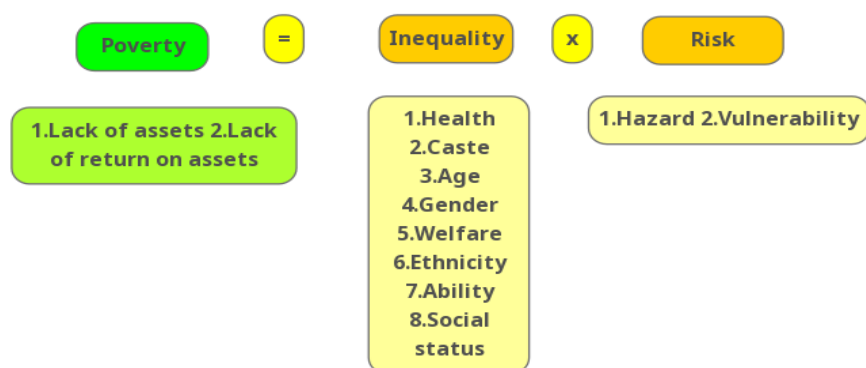


Diagram3. Poverty Equation.

Adopted from (Concern Worldwide U.S., Inc, 2020) and modified by the (\*\*Author, 2023)

Diagram edit was done by author using the software mindmup <https://app.mindmup.com/>

Health and Poverty - If an individual doesn't eat enough, they'll lack both strength and energy needed to work effectively; Ethiopia Loses 16% of its Gross domestic product (GDP) due to stunting<sup>1</sup>.

Coronavirus disease 2019 (Covid-19) was a large-scale health crisis but it was not the first to intensify poverty and spiralled its cycle. (*Concern WW US*, 2022). Prior to 2019, up to 10% of the world population was suffering from extreme poverty and having struggles fulfilling the most basic needs. (*UN*, 2020)

Education and Poverty - Education carries hope, steady pathways and access to better resources and routes that ensures the attainment of required skills that household members would need to strive. The United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates that 171 million people can potentially escape extreme poverty if they had only left school with reading skills. (*Concern WW US*, 2022)

Capital and Poverty - The World Bank Group promotes sustainable and inclusive economic growth, through investment in infrastructure as well as fueling human capital starting from a child's early years, as individuals with skills, education, health, training and experience make the biggest contributions to their countries growth and prosperity. (*Kieran McConville*, 2020)

### Ending Poverty

The MDG #1 was thought to be not ambitious enough, as this "incredible" achievement yet was procured with minimal gains for the poorest. (*Ravallion 2016*)

The UN's SDGs came to include ending extreme poverty by 2030. Being more challenging, yet more yearning. SDG #1 cannot be attained if the poorest are left behind, as we saw in the MDG #1 period.

The global \$1.9<sup>2</sup> standard may not reflect the full and accurate standard of living of the vulnerable on a country level. (*Ravallion and Chen 2019*). When there is a prominent poverty gap, the existence of the combination of economic

growth, and economic development can be challenging. (*Martin Ravallion, Edmond D. Villani*, 2020)

(*Lampman*, 1965) provided measurements needed for closing poverty gaps to ensure that all individuals attain the minimum required income for the suitable standard of living. Subsequently, transfers were used as a means to close the gap and observe the void if it had still existed which came to be identified as the cost of ending poverty using transfers. (*Sachs*, 2005, p.290) used the aggregate poverty gap to measure how much foreign aid would be needed to eradicate poverty. (*Chandy et al.*, 2016) concluded that the global poverty gap was approximately \$80 billion dollars referring to the \$1.9 line and called on the world's billionaires to come together to close the gap, to eventually end poverty. (*Martin Ravallion*, 2020). (*Amartya Sen*, 1987) advocated for the vitality of individuals' ability to function in society. Poverty strikes when people miss out on capabilities leading to inefficient income resulting in poor education, poor health care, insecurity, low self-confidence, and a sense of high dependency.

### If Poverty Pertains...

If poverty does not end; people will suffer from hunger, lack of good health care systems, endure hazardous lives, quality education access will be limited, and potential will eventually be lost. (*Hulme*, 2010). Poverty hinders development as growth prospects are jeopardized. (*Ravallion*, 2009).

(*Bird et al.*, 2002) stated that a significant proportion of the chronically poor occupied remote rural areas...The chronically poor are doomed to combat multiple deprivations including; hunger, malnutrition, illiteracy, unsanitary drinking water, limited access to basic health care services, social discrimination, insecurity and exclusion. (*Chronic Poverty Research Centre (CRDC)*, 2009)

### Restoring and Sustaining Economic Growth

Poverty shapes shift according to gender, race, age, location (rural versus urban), and income source. These variations among the poor mirror

<sup>1</sup> Stunting: Is the impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation. (*World Health Organization (WHO)*, 2015)

<sup>2</sup> The 1.9\$ global poverty line update - In September 2022, the World Bank updated the extreme poverty

line from \$1.90 per person / day in terms of the 2011 Purchasing power parity (PPP) to \$2.15 per person / day in terms of the 2017 PPP. In most countries this change did not substantively alter the number or proportion of people living in extreme poverty. (*Zach Christensen*, 2023)

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highly complex reflections on markets and public policies. (Mahmood Hasan Khan, 2001)

The degree to which economic growth stimulates poverty rate reduction depends on the degree to which the poor take part in the growth process and share in its benefits. This means that policies ought to make labour markets operate effectively, actively remove inequalities and bias and promote financial inclusion. (Department for international development, 2008)

### Poverty Approaches

Welfarist approach - Poverty involves the inability to attain the income needed to afford basic consumer goods to be at a minimal standard of living. Non-welfarist or capability-based approach - Poverty involves the inability to be considered at a good and well state: good health, education, nutrition, the ability to participate in productive employment. (Assaad, Ragui; Rouchdy, Malak, 1999)

### Human Development Status in the Arab Region

Human development status in the Arab region is characterised by inequalities in power, influence

### Forms of Poverty

and access to control over resources between social groups; to overcome poverty it is crucial to address those who possess weaker structural position because of biased constructions and reinforce norms and values. To combat poverty and realise the development goals. Countries should run policies that support the notion that supports the importance of education whereby every child enrolls and stays in school. (Sida, 2019)

Limited access to essential education, healthcare systems, and other public services hinders inclusion in all its forms as it limits the ability of the vulnerable to stay healthy and build necessary capital, ultimately fighting off productivity, growth and development. In Egypt and Jordan, children mortality in deprived households is double than those who are born into economically satisfied families.

In Egypt, Morocco, Yemen, and Syria, 25% of children in lower income quintiles are malnourished and the likelihood of those chronically malnourished to have dropped out of school by the time they reach the age of 16, is high. (Sida, 2019)



**Diagram4.** Dimensions of Poverty Conceptual Framework (Sida, 2017)

As per the above model; poverty is not only about the lack of material resources but also the lack of functionings and capabilities. Where a person living in poverty is resource deprived in one if not multiple of the other dimensions that are mentioned in Web of multiple dimensions of poverty, diagram (1) adopted from (Gweshengwe, 2020) The model also provides a structure for multidimensional poverty analysis to answer the questions of who is poor and in what way? (Sida, 2017)

Though studies are always undergoing on the means and importance of combating poverty, it is still an issue. As some strategies dealing with poverty reduction are fitted in some contexts and ill fitted in others. Therefore, taking into consideration the social context, the term poverty needs to undergo a sophisticated examination to limit its effect on the poor and other vulnerable groups (Daw et al., 2011; Hassan, M.K., Alshater, M.M., Banna, H. and Alam, M.R. 2022)



## **EMPIRICAL EVIDENCE - EGYPT**

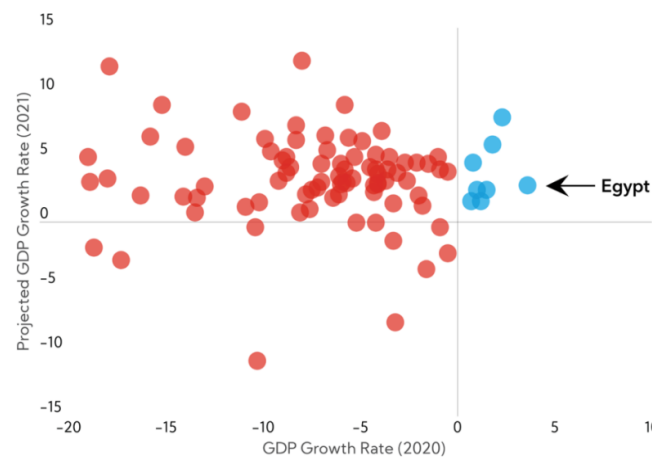
### **Growth and Development in Egypt**

Poverty levels decrease at a nimbler pace than economic growth rates due to the highly impactful nature of poverty on growth (*United Nations Development Programme (UNDP) & Institute of National Planning (INP), 1996; Nassar, Heba&Biltagy, Marwa,2017*)

Egypt has made significant improvements in areas of human development over the past several decades. Still, important goals remain unattained

including stalling fertility rates, high unemployment rates, dominant inequalities, a large informal market, and low female labour participation.

Covid-19 and poverty - Nonetheless, Egypt was one of the few emerging economies that had positive growth rates in 2020, as shown in the figure (1) (*IMF,2020*) below, Due to the government's effective response, the timely period of the lockdown as well as Egypt's diversified economy. (*IMF,2021*)



**Figure1.** Egypt's economic growth pre and post Covid-19

**Source:** (*IMF, 2020*)

There is a need to build and maintain efficient economic databases to enhance the ability to assess and foresee potential alternative policy outcomes. (*International Finance Corporation (IFC), 2020;UNDP, Ministry of Planning and Economic Development, 2021*)

### **Egypt's Poverty Profile**

**Poverty Profile** - There are two sets of major socio-economic variables directly correlated to poverty. The first set relates to the socio-demographic profile of the poor, such as age and household composition, educational attainment and employment status, and together they refer to the characteristics of the poor. The second set relates to the input and process of adding value indicators that contribute to poverty, or act as sources and causes of poverty; Such indicators are used to investigate root cause/s of poverty. (*El-Laithy, Heba.,2017*)

### **Human Capital Development Theory**

Poverty reflects on many dimensions, not only income (*UNDP, 2009*). To combat poverty, a correctly allocated improvement in human resources and increased investment in human

capital should take place first. (*Li Wei, 1994*). Human development investment is vital to eradicate multidimensional poverty which can be tackled through two channels; the first is indirectly through working on the long-term development of the country through maintaining a labour force that is more effective and productive. The second one is through making sure the input needed for the required output is available through quality education, training, skills, and health as these strands are believed to have an effect impacts on poverty alleviation through improved productivity and incomes. (*Siddig, 2010*)

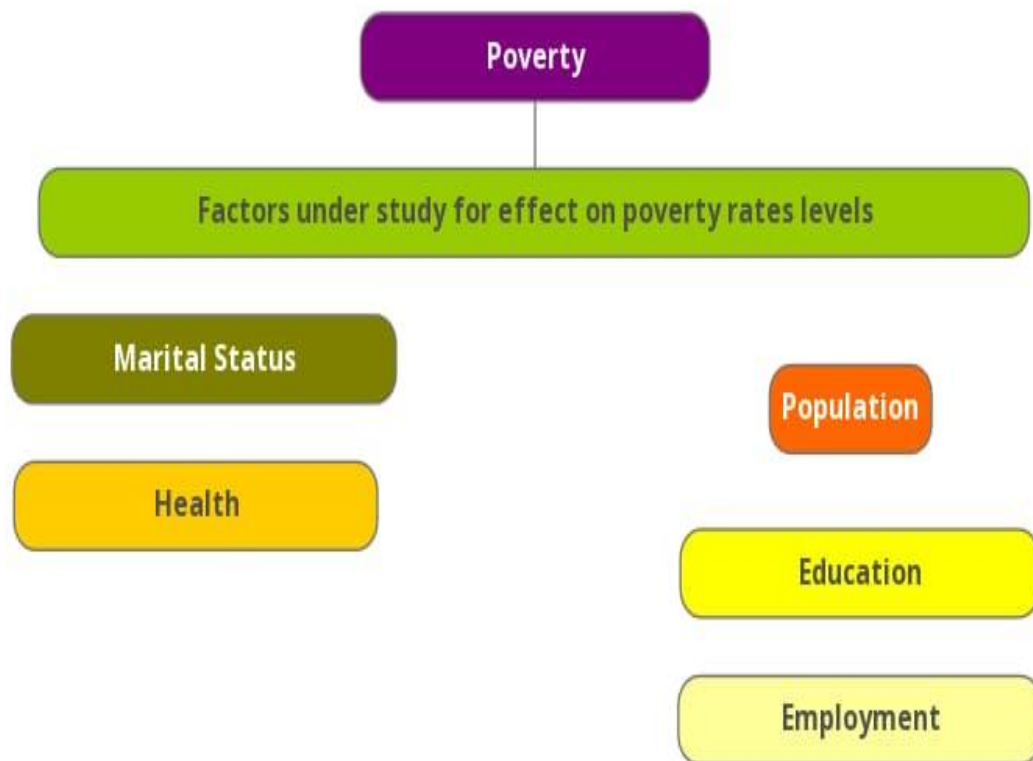
Data analysis on income poverty and non-income poverty conducted that up to 70% of the poor are not considered amongst the low earning makers; It was indicated that boosting income may have positive results on many dimensions affected by poverty (*Wang et al., 2016*). If an illiterate individual lives above the income poverty line; the educational status of this individual is presumed to remain constant. On the other hand, a person with health issues; that person would need more income to maintain a suitable living standard. (*Bourguignon and Chakravarty, 2003*)

### Protecting Human Capital Gains and Improving Outcomes

Crises shed light on the vitality of investing in human development, including achieving quality health care systems and pandemic preparedness,

### The Research Design and Methodology

providing education, remote learning channels, ensuring equity for minorities, expanding social protection coverage, promoting productivity, and developing adaptable programs and policies. (World Bank, 2021)



**Diagram5.** The model that derived the research question and hypotheses

Built by author using the software mindmup<https://app.mindmup.com/>

### Research Question and Hypotheses

**RQ<sub>1</sub>** “What are the prominent determinants that have an impact on the aggregate poverty rates in the Arab Republic of Egypt governorates?”

**-The aggregate poverty rates in the Arab Republic of Egypt governorates over the past 15 years**

**H<sub>0</sub>1.1** Death rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.2** Maternal mortality rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.3** Under 5 child mortality rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.4** Unemployment rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

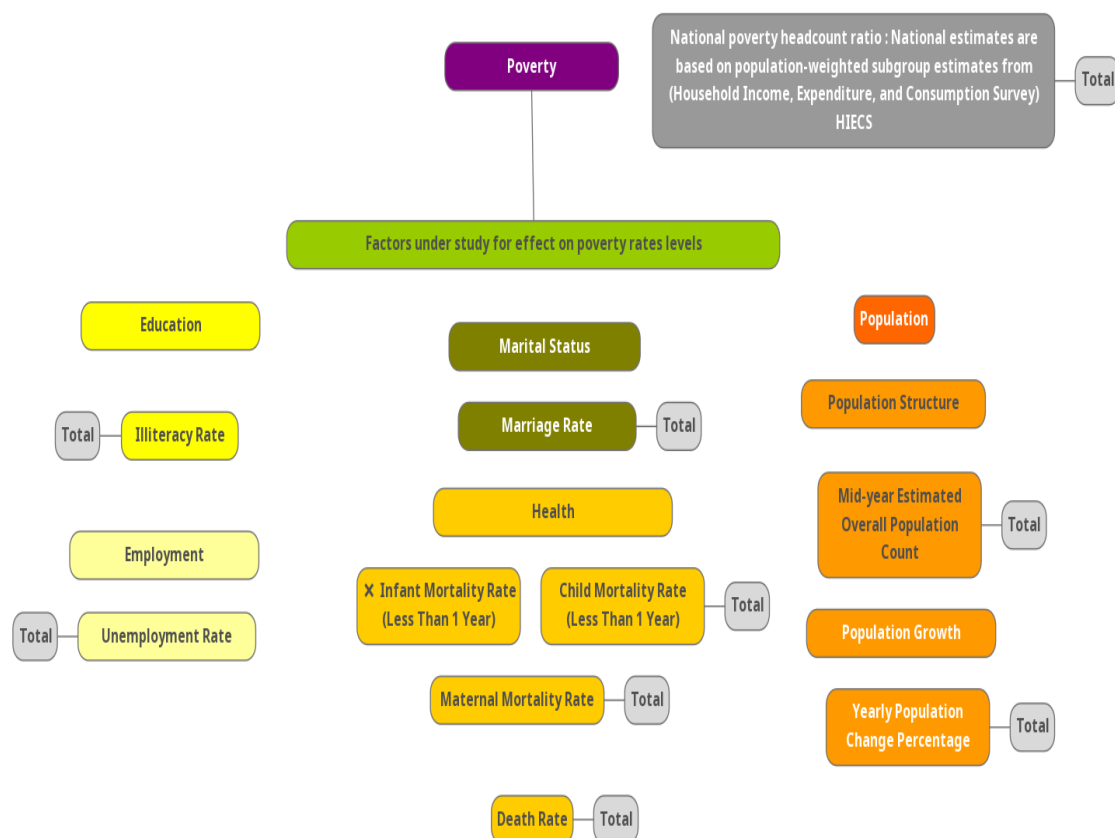
**H<sub>0</sub>1.5** Illiteracy rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.6** The population structure has no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.7** Population growth rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

**H<sub>0</sub>1.8** Marriage rates have no significant effect on the aggregate poverty rates in the Arab Republic of Egypt governorates

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**Diagram5.1.** The Detailed model that derived the research questions and hypothesis

Built by author using the software mindmup<https://app.mindmup.com/>

An analytical approach is employed using panel data through data derived from the Household Income, Expenditure and Consumption Surveys (HIECSs), which is the main source of data for poverty monitoring in Egypt; due to its great advantage of having a large sample size; which allows estimating more accurate poverty rated at the governorate and district levels. (*Oxford Poverty and Human Development Initiative (OPHI), 2016; Abeer Mohamed Ali Abd Elkhalek, 2018*)

That was pursued to develop comprehensive results, data from the country's official statistical authority; Data on population below the country's poverty threshold based on HIECSs. Data for employment was derived from the annual labour force bulletin which includes data on: manpower size, labour force and measuring employment, unemployment beside data on education and illiteracy

Population in Censuses and Egypt's Demographic and Health Surveys included data on population, its structure, and vital statistics.

This study follows a quantitative approach involving the collection of numerical data and conducting mathematical analyses to observe trends, make predictions to test hypotheses, to acquire appropriate and relevant sets of processed data that works and aims for a stable economy, better standard of living and a functionings.

Since as defined by (*Amartya Sen,1987*)the individuals' ability to function in the society effectively is the base for a sound and development driven community.

(*Haughton & Khandker, 2009, p. 2-3*) viewed boosting incomes as well as empowering the poor are equally vital to stand against crises that may push the vulnerable further below the poverty line and spiral them away from the way out and tragically face deprivations including, hunger, malnutrition, illiteracy, unsanitary drinking water, limited access to basic health care services, social discrimination, insecurity and exclusion.(*CPRC, 2009;Rohwerder, B., 2016*)



## DATA COLLECTION AND ANALYSIS

### Data Collection

**Table1.** Source of values for the selected variables

Variable/s	Source
Source for all variables in the model to be analysed: Central Agency for Public Mobilization and Statistics (CAPMAS)-Government agency <a href="https://www.capmas.gov.eg">https://www.capmas.gov.eg</a> Data collected was from the 27 governorates of the Arab Republic of Egypt from the year 2006 to the year 2021.	
<b>Poverty rates</b> <sup>3</sup>	Income, expenditure and consumption survey.
<b>Death rate (DR)</b>	Crude death rate according to the governorates
<b>Maternal mortality</b> <sup>4</sup> (MM)	Maternal mortality rate by Governorates
<b>Under-five child mortality</b>	Child mortality under five rates by governorates
<b>Infant Mortality Rate</b>	Infant Mortality Rate by Governorates
<b>Unemployment rate (UR)</b>	Unemployment rate (15-64 years) according to governorate
<b>Illiteracy rate (ILLR)</b>	Illiteracy rate (10 years and over) according to gender and governorates
<b>Population structure (PS)</b>	The estimated population inside the Republic
<b>Population growth</b>	Population growth rate at the governorate and national levels
<b>Marriage rate</b>	Marriage rates according to governorates during the time period

### Data Analysis

#### Descriptive Statistics

**Table2.** Descriptive Statistics for Number of values, Minimum, Maximum, Mean and the Standard Deviation values

Variables	N	Minimum	Maximum	Mean	Standard Deviation
<b>Poverty Rate</b>	432	0.0	79.0	26.9	18.1
<b>Death rate</b>	432	3.4	13.0	5.8	1.2
<b>Maternal Mortality Rate</b>	432	0.0	107.0	50.8	14.9
<b>Under 5 Child Mortality Rate</b>	432	8.2	45.4	19.3	5.7
<b>Infant Mortality Rate</b>	432	3.0	36.5	14.2	5.1
<b>Unemployment rate</b>	432	0.0	48.2	10.9	5.4
<b>Illiteracy rate</b>	432	5.4	46.5	22.1	8.6
<b>Population structure</b>	432	67229.0	102060688.0	6260585.6	15971098.7
<b>Population Growth Rate</b>	432	0.6	76.9	2.7	4.5
<b>Marriage Rate</b>	432	1.5	17.0	9.2	2.3

Calculated by the author



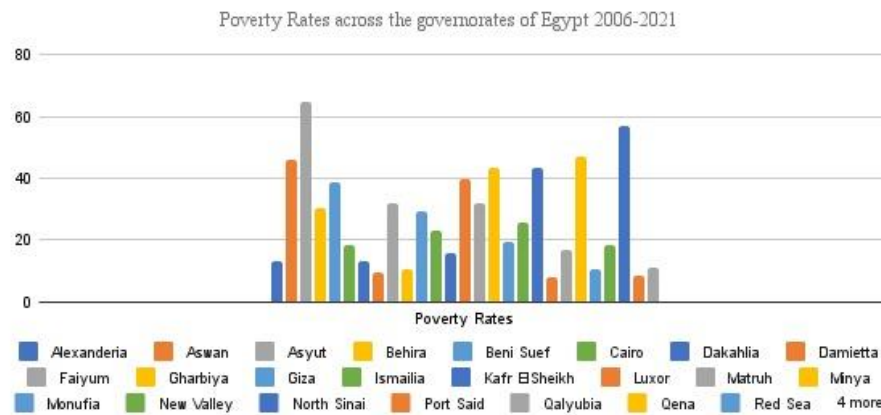
**Figure2.** Descriptive statistics for the poverty rates over the time period of 2006-2021

#### Descriptive Statistics for the Poverty Rates across the Republics Governorates

<sup>3</sup> The income, expenditure and consumption research for 2019/2020 was supposed to extend from October 2019 to September 2020, but the research stopped in March 2020 due to the Covid-19 pandemic consequently the precautionary measures taken by the government. (CAPMAS,2020 (a,b))

<sup>4</sup>Maternal mortality rate vs. maternal mortality ratio The maternal mortality rate is the number of maternal deaths in a population divided by the number of women of reproductive age. It captures the likelihood of both becoming pregnant and dying during pregnancy (including deaths up to six weeks after delivery). *Sustainable Development Solutions Network (SDSN) (Retrieved, April,2023). <https://indicators.report/indicators/i-17/>*

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**Figure3.** From the above figure, it can be concluded that the highest aggregate poverty rate was recorded in Asyut, while the lowest rate was in South Sinai.

### Correlation Analysis

The values of Pearson's Correlation Coefficient for the main variables are the table found in the following table;

- Poverty rate is negatively correlated with death rate, unemployment rate, while it has a positive correlation with maternal mortality,
- the under 5 child mortality, infant mortality, illiteracy rate and the marriage rate.
- There is no multi collinearity problem as there is no strong correlation between the independent variables, except for infant mortality and under 5 child mortality; The under 5 child mortality was used.

**Table3.** Correlation analysis

Variables	Poverty Rate	DR	MM	Under 5 Child Mortality	Infant Mortality	UR	ILLR	PS	Population Growth	Marriage Rate
Poverty Rate	1									
DR	-.169**	1								
Maternal Mortality Rate	.243**	.016	1							
Under 5 Child Mortality Rate	.344**	.371**	.275**	1						
Infant Mortality Rate	.264**	.321**	.276**	.913**	1					
UR	-.147**	.196**	-.076	-.050	.029	1				
ILLR	.363**	-.219**	.400**	.170**	.159**	-.359**	1			
PS	.068	.347**	.102*	.147**	.137**	-.182**	.230**	1		
Population Growth Rate	-.029	-.097*	-.056	-.055	-.036	-.074	.022	-.112*	1	
Marriage Rate	.124**	.242**	.113*	.024	.073	.112*	.157**	.232**	-.003	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

Calculated by the author

### Answering the research question

To answer the research question, the following model will be estimated

$$\begin{aligned}
 \text{Poverty rate}_{it} = & \beta_0 + \beta_1 \text{death rate} + \beta_2 \text{Maternal mortality} + \\
 & \beta_3 \text{under 5 child mortality} + \beta_4 \text{unemployment rate} + \beta_5 \text{ill. Rate} + \\
 & \beta_6 \text{population structure} + \beta_7 \text{population growth} + \beta_8 \text{marriage rate} \\
 & + \mu_i + \varepsilon_{it}
 \end{aligned}$$

To estimate this model, any mixed-effect model as well as the Generalised Method of Moments (GMM) method, can be used. It is known that the estimation process of the mixed-effect models depends on a main assumption, which is that the probability distribution of the error

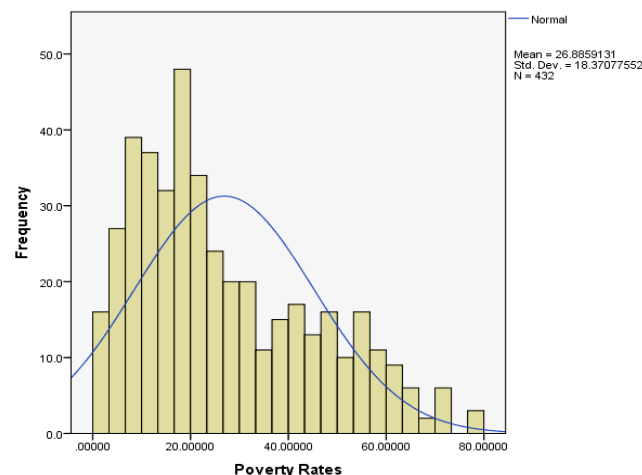
term (or dependent variable) follows normal distribution.

From the following table and figure it is apparent that the poverty rate is not normally distributed as the significance of the test is less than 5%.

**Table4.** Normality test

Test	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Poverty Rate	.121	432	.000	.931	432	.000

Calculated by the author



Based on the above figure (4), violation of the normality assumption is concluded; a good candidate for the estimation process is the GMM developed by (Arellano and Bond,1991). GMM estimation was formalised by (Hansen,1982), and since then it has become one of the most widely used methods for estimation of models in economics and finance. Unlike the Maximum Likelihood Estimation (MLE), GMM does not require the complete knowledge of the distribution of the data. In models where there are more moment-conditions than model-parameters, GMM estimation provides a straightforward means to test the specification of the proposed model. This is a vital feature that is unique to the GMM estimation.

Unobserved cross-sectional-specific effects are controlled by differencing the regression equation and using instrumental variables based on previous observations of the explanatory variables. Differencing the regression equation also controls the potential level effects. Both of them can be used as the panel units (Governorates) are large and the time periods are annual.

However, this standard GMM estimator has been found to have poor finite sample properties (bias)

that is highly persistent in the series. In this case the lagged levels of the series are correlated weakly with the first differences, and this leads to weak instruments for the first-differenced equations. (Arellano and Bover,1995) and (Blundell and Bond,1998) demonstrated that the System Generalised Method of Moments (SYS-GMM) approach; upon having additional moment restrictions, permits lagged first differences to be used as instruments in the levels equations, and this fixes any biases that could have emerged upon using the standard GMM estimator.

To ensure the validity of the model two important tests for GMM estimation are used to check the accuracy of the model after estimating it

#### 1. Sargan–Hansen test or Sargan's test

A statistical test used for checking on over-identifying restrictions in statistical models. In other words; It is a test used to check if the instrumental variables used are accurate or not.

The null hypothesis of this test is "no over-identification". The model is accurate if the null hypothesis is not rejected

#### 2. Arellano-Bond

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A test which checks if the errors are correlated or not. The null hypothesis is "no autocorrelation". The model is accurate if the null hypothesis is not rejected.

Before running the model, Variance Inflation Factor (VIF) values are checked, from the below table it can be concluded that there is no multicollinearity problem, as VIF for all variables is less than 10.

**Table5.** VIF values

Variables	Collinearity Statistics	
	Tolerance	VIF
DR	.589	1.699
Maternal Mortality Rate	.786	1.272
Under 5 Child Mortality	.742	1.347
ILLR	.609	1.643
UR	.793	1.261
PS	.730	1.369
Population Growth Rate	.971	1.030
Marriage Rate	.842	1.187

*Calculated by the author*

### Summary of the Model

In the following table the results are summarised, according to the listed results, the p-value of

Wald CHI2 equals 0.000 which is significant (less than 0.05); This means that there is at least 1 of the independent variables that has significant effect on the poverty rate.

**Table6.** Summary of model 1

System dynamic panel-data estimation  
Group variable: GID  
Time variable: Year

Number of obs = 405  
Number of groups = 27

Obs per group:  
min = 15  
avg = 15  
max = 15

Number of instruments = 84

Wald chi2(9) = 1461.26  
Prob > chi2 = 0.0000

*Calculated by the author*

### Coefficient Analysis Results

#### 1. Total death rate

A significant negative impact on the poverty rate; For every 1 additional unit in the total death rate the poverty rate will decrease by 5.14%, keeping all other variables fixed and at a 95% confidence interval.

#### 2. Under 5-child mortality rate

A significant positive impact on poverty rate; For every 1 additional unit in the under 5-child mortality rate the poverty rate will increase by 1.324% keeping all other variables fixed and at a 95% confidence interval.

#### 3. Illiteracy rate

A significant positive impact on poverty rate; For every 1 additional unit in the Illiteracy rate the poverty rate will increase by 0.337%

keeping all other variables fixed and at a 95% confidence interval.

#### 4. Marriage rate

A significant positive impact on poverty rate; For every 1 additional unit in the marriage rate the poverty rate will increase by 1.232% keeping all other variables fixed at a 95% confidence interval.

#### 5. Other variables

No significant impact on the poverty rate keeping all other variables fixed at a 95% confidence interval.

#### 6. Lagged values of poverty

A significant positive impact on the poverty rate keeping all other variables fixed at a 95% confidence interval.

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**Table7.** Coefficients of model 1

Variables	Poverty Rates for governorates
<b>L.Povert Rates for governorates</b>	0.896***
	(0.0304)
<b>DR</b>	-5.141***
	(0.791)
<b>MaternalMortality</b>	0.0531
	(0.0558)
<b>Under5ChildMortalityRate</b>	1.324***
	(0.149)
<b>UR</b>	-0.0343
	(0.153)
<b>ILLR</b>	0.337***
	(0.110)
<b>PS</b>	$3.05 \times 10^{-7}$
	$(3.47 \times 10^{-7})$
<b>Population Growth Rate</b>	-0.144
	(0.165)
<b>MarriageRate</b>	1.232***
	(0.345)
<b>Constant</b>	9.572*
	(5.404)
<b>Observations</b>	405
<b>Number of (Group Identifier) GID</b>	27
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1	

Calculated by the author

### Goodness of Fit for GMM Model

**Table8.** Serial correlation test

Sargan test of overidentifying restrictions  
H0: Overidentifying restrictions are valid

```
chi2(74)      = 26.13003
Prob > chi2   = 1.0000
```

Calculated by the author

According to the table above, there is no autocorrelation problem as the p-value for the second lag is greater than 5%.

**Table9.** Overidentification test

Order	z	Prob > z
1	-3.2167	0.0013
2	.55233	0.5807

Calculated by the author

According to the Sargan test, there is no over identification problem which indicates the goodness of fit of the test.

## CONCLUSION

Over the last 27 years, around 1 billion people have been able to escape poverty and the global rate of poverty is lower than ever before, according to the World Bank Group. (*Penny appeal*, 2020). *That is hope...*

The poverty rate among married couples is substantially lower than the poverty rate among single-headed households, Marriage remains one of the prominent weapons against poverty, poverty and welfare dependence level impacts both children in single parent headed households



along with the parents and the society as a whole will continue to struggle.

Since marital rates decline drives up poverty and welfare dependence, aspiring to healthy marriage grounded norms, knowledge, education and capacity building for individuals drives this impact deeper and further. (*Robert Rector, 2010*)

“Education attainment is where the future starts, toits being a fundamental human right. It’s also a key ingredient to ending poverty”. Meaning that literacy is a tool in maintaining a safe and healthy community, as it reflects the ability of individuals to develop their skills and seek improved livelihoods. (*Olivia Giovetti, 2020*)

Evidence showed that the rise in child mortality has significantly affected the poorest areas of the countries (*Kim D ,Saada A . ,2013; Kihal-Talantikite W, Padilla CM, Lalloué B, et al.,2013*)

Furthermore, a deterioration in multiple aspects of children's health and development was noticeable. (*Wang H., Liddell CA., Coates MM., et al.,2013; Wickham S., Anwar E., Barr B., et al. Poverty and child health in the UK: using evidence for action,2016*)

Based on a systematic review conducted by (*Cooper and Stewart,2013*); poorer children have less cognitive, social-behavioural and health outcomes in part because they are poorer, in addition to other household and parental characteristics. (*Taylor-Robinson D, Lai ETC, Wickham S, et al, 2019*)

Biological hazards such as Covid-19, etc. can intensify poverty and slow deprivation alleviation. Based on reports from 80 countries under the Sendai Framework<sup>5</sup>, the disaster-related mortality rate was 5.74 persons per 100,000 population. As countries were coping with the economic fallout of the pandemic, 33 countries reported \$16.5 billion in economic losses in 2020, due to other disasters. (*United Nations Statistics Division (UNSD), and (Division of the Department of Economic and Social Affairs (DESA), 2022*)

Poorer countries are found to bear a greater welfare loss from the pandemic. Mainly through health and economic consequences both compute

the tremendous welfare loss. (*Ferreira F., et. al, 2021*)

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<sup>5</sup>The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) was the first major agreement of the post-2015 development agenda and provides Member States with concrete actions to protect development gains

from the risk of disaster. *UN Office for Disaster Risk Reduction (UNDRR) (Retrieved April, 2023)* <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework>

- (October 2020) [https://mped.gov.eg/AdminPanel/sharedFiles/ae32ff30-2ec9-4633-a128-99d66bb3e748\\_The%20impacts%20of%20COVID-19%20on%20Egypt%E2%80%99s%20economic%20sectors.pdf](https://mped.gov.eg/AdminPanel/sharedFiles/ae32ff30-2ec9-4633-a128-99d66bb3e748_The%20impacts%20of%20COVID-19%20on%20Egypt%E2%80%99s%20economic%20sectors.pdf)
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