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Analyzing the Determinants of Life Expectancy in Bangladesh: A VECM Approach

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Abstract

This study elucidated the influence of financial development, economic growth, carbon emissions, population growth and food production on life expectancy in the context of Bangladesh. The data utilized encompasses the period from 1974 to 2019. The utilization of the Vector Error Correction Model (VECM) approach allows for the examination of both short-run and long-run correlations among variables. The ADF test was conducted to determine the stationarity of all variables, revealing that they are integrated of order 1. This implies that all variables exhibit stationarity when differenced once. The Johansen cointegration test was utilized to determine the presence of cointegrating equations in the variable. The outcomes of the trace test indicated that there is a maximum of two cointegrating equations. Economic growth and financial development have a positive impact on life expectancy, whereas carbon emissions a have a negative impact. Economic progress and financial development make life expectancy better, while carbon emissions make it worse. The findings show that policies should be put in place to reduce carbon emissions and slow population growth while also boosting economic growth, financial development and food production to improve people's health. Bangladesh should consider implementing policies such as strengthening financial development, adopting clean and green technology, and enforcing rigorous environmental pollution regulations. These measures are essential for enhancing life expectancy, improving overall human well-being, and ultimately achieving sustainable development goals.

Keywords: Economic Growth, Life Expectancy, Financial Development, Population Growth, Food Production Index, VECM Approach.

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1. Introduction

Life expectancy is a critical indicator of a nation's overall well-being, reflecting its social progress, human health, and economic growth (Kunze, 2014). In recent decades, Bangladesh has witnessed a remarkable transformation in life expectancy, with projections indicating an increase from 46.507 years in 1972 to an estimated 73.29 years in 2022, according to World Bank Report (2023). This notable rise in life expectancy has been largely attributed to improvements in living conditions, access to education and economic development. However, the intricate relationship between life expectancy, economic growth and carbon emissions presents a complex puzzle.

Despite the undeniable link between rising life expectancy and economic growth, Bangladesh faces a paradoxical situation where simultaneous increases in economic prosperity and carbon emissions have created a perplexing interplay of influences on life expectancy. While economic growth has led to elevated living standards, better healthcare and improved access to education, carbon emissions have unleashed environmental consequences, affecting air and water quality, as well as the overall well-being of the population. This dynamic raises pressing questions about the sustainability of these trends and their long-term implications for life expectancy in Bangladesh (Mahumud et al., 2013).

Understanding the intricate relationship between economic growth, carbon emissions, and their impact on life expectancy is of paramount importance. This study aims to untangle the web of influences shaping life expectancy in Bangladesh by examining the conflicting forces of economic growth and carbon emissions. By conducting a rigorous analysis, we seek to shed light on the complexities of this relationship and provide insights that can inform policy decisions to ensure a healthier and more sustainable future for the nation's inhabitants.

According to World Bank (2023), Bangladesh's life expectancy at birth has showed a constant rising trend, despite sporadic changes. The life expectancy increased noticeably by 2020, rising to 71.9 years. The upward trend in population health and overall living conditions suggests a profound improvement in the quality of life for people.

Between 1974 and 2021, the real gross domestic product (GDP) increased significantly, from $30.3 billion to $285.2 billion. The actual Gross Domestic Product (GDP) of Bangladesh experienced the largest rise from 2005 to 2016, with an average yearly increase of above 6%. However, the COVID-19 pandemic has slowed Bangladesh's actual economic progress, just like it has in other countries. The real Gross Domestic Product (GDP) showed admirable resilience despite the ongoing epidemic, registering a notable growth rate of 5.2% in 2020 and a further increase of 6.1% in 2021.

Agriculture, water resources and public health are just a few of the sectors of the economy that are significantly at danger from the phenomenon of climate change. The World Bank data 2023 used in this study show the pattern of Bangladesh's carbon emissions from 1974 to 2019. The results indicate that there has been a significant increase in carbon emissions over time. Bangladesh's carbon emissions were 4660.757 kilotons (kt) in 1974; however, they significantly increased in 2019 to 90739.99786 kt.

The food production index for Bangladesh is a measure of the amount of food that is produced per capita in the country. The index is based on the number of people who live in a country and the number of people who are able to produce food. The graph shows the food production index for Bangladesh from 1972 to 2021. The index is set to 100 in 2004-2006, so a value of 116.4 in 2021 means that food production per capita was 16.4% higher in 2021 than it was in 2004-2006. The overall trend in the food production index for Bangladesh is positive. The index has increased from 28.3 in 1972 to 116.4 in 2021. This means that food production per capita has more than quadrupled over the past 50 years. Therefore, the objective of the study is to examine the long run relationship among the variables.

This study is organized into several sections to comprehensively address the objectives outlined above. In Chapter 2, we provide a literature review to contextualize our research with theoretical framework. Chapter 3 presents the data sources and methodology used for analysis. Chapters 4 delve into the empirical findings regarding the impact of economic growth and carbon emissions on life expectancy, respectively. Lastly, Chapter 5 synthesizes our findings and offers policy recommendations, highlighting the path forward for Bangladesh's sustainable development and the enhancement of its citizens well-being.

2. Literature Review

Many researchers agree that increasing life expectancy boosts economic growth by encouraging investment in human capital. Longer life expectancy leads to a higher return on human capital, encouraging more investment in education and stimulating economic growth. Kalemli-Ozcan et al. (2000) used an overlapping generation model with continuous time to study the influence of life expectancy in human capital investment during economic growth. Their findings indicate that life expectancy supports increased schooling. By integrating these theoretical frameworks into our investigation, we can develop a strong conceptual basis for our research on the factors influencing life expectancy in Bangladesh.

Numerous scholarly studies have explored the factors influencing life expectancy in both developed and emerging economies.

He & Li (2020) examined the relationships, both in the short and long term, between life expectancy and economic growth across a sample of 65 nations characterized by varying degrees of population ageing. The analysis covers the period from 1980 to 2014. The study used panel cointegration analysis and panel causality tests to examine the interrelationships. The findings indicate that there exists a statistically significant positive correlation between life expectancy and GDP per capita in the majority of countries. Moreover, this association is more pronounced in countries characterized by higher levels of ageing. The findings from the panel causality tests indicate the presence of short-term unidirectional causality, wherein life expectancy has a causal influence on economic growth for younger age groups. Conversely, there is evidence of unidirectional causality, with economic growth exerting a causal impact on life expectancy for older age groups. The aforementioned studies indicate that the link between life expectancy and economic growth is Kunze (2014) examined the correlation between life expectancy and economic growth within the framework of an overlapping generations model that incorporates family compassion. In this model, both private and state investments in the human capital of children play a crucial role in driving endogenous growth. The research reveals that there is an inverse association between life expectancy and income per capita increase, but this association is frequently not statistically significant before the occurrence of the demographic shift. However, following the transition, the correlation becomes significantly positive. The findings present a novel perspective on the currently conflicting data and bear significant consequences for policymaking.

Acemoglu & Johnson (2007) study employed OLS regressions and instrumental variable (IV) methodology to ascertain the influence of life expectancy on a range of economic and population-related indicators. In addition, the researchers utilize a long-difference specification, which involves analyzing data from several time periods, in order to investigate the correlation between life expectancy and characteristics associated with population. The results indicate that there is a correlation between a rise in life expectancy and favorable impacts on both economic growth and population-related indicators.

Anand & Ravallion (1993) found a strong relationship among life expectancy and GNP per capita. When explanatory variables such as public expenditure on poverty and health are considered, the findings indicate that GNP has a negative effect on the first model.

Numerous studies on developed and developing (emerging) countries look at how emissions effect health. According to Nweke and Sanders III (2009), emissions were a primary cause of the large disease load suffered by Africans. Matthew et al. (2018) evaluated the connection between public health spending and health outcomes in Nigeria employing the autoregressive distribution lag (ARDL) econometric approach.

Kibria and Ullah (2020) studied the influence of carbon dioxide, urbanization, and economic growth on Bangladeshi life expectancy from 1972- 2014. They discover that all variables are stationary at I(1) using the time series unit root test. In Bangladesh, CO2 and urbanization have a bidirectional link with life expectancy, whereas economic growth has no causal relationship with life expectancy. Rizzo (2019) examined a variety of socioeconomic factors that affect life expectancy in 34 low-income countries and finds that subsidized health care costs, access to basic healthcare facilities, the prevalence of HIV, urbanization, sex and education are important factors that increase life expectancy, while corruption, foreign aid and malnutrition are found to have only a tenuous relationship with life expectancy. Additionally, it was found that the LEAB was negatively and significantly impacted by the overall fertility ratio. On the other hand, it is discovered that the effects of CO2 emissions, inflation rate, and the degree of urbanization on LEAB are negligible.

From 2001 to 2011, Bilas et al. (2014) investigated the LEAB bases in 28 member states of the European Union. There is a ton of research on environmental risks, but there aren't many studies on how CO2 has affected life expectancy in the last several decades. However, the outcome demonstrates that CO2 emissions have a detrimental impact on life expectancy in both the short- and long-term for all MENA countries.

Naeem et al. (2021) tried to explore the effects of CO2 emissions on infant health in Pakistan from 1975 to 2013. Some many economic factors were used in our analysis, and the results show that CO2 emissions have a negligible impact on child mortality. Increasing health-care facilities reduces child mortality in the short term, however the relationship reverses in the long run. In the short run, urbanization appeared to be a risk factor for child mortality. While income inequality continues to be inversely related to child mortality. Fertility and poverty are both found to be risk factors for child mortality. The people with higher poverty of the economy appeared to have higher child mortality rates due to inadequate health care and low living standards.

Patz et al. (2007) explored the global consequences of climate change on health. The study quantified global warming using cumulative depleted CO_2 emissions per capita. Their report found that climate change is increasing health risks and that poor countries are less to blame.

In the D-8 countries (Indonesia, Malaysia, Nigeria, Bangladesh, Egypt, Pakistan, Iran, and Turkey) between 1992 and 2017, Murthy et al. (2021) analyzed the influences of CO_2 emissions on life expectancy. To do this, we use the panel ARDL technique and pick the PMG estimator. The data show that while health expenditure, population growth and economic growth can all have a positive impact on life expectancy, CO_2 have a negative impact on it. The primary findings indicate that the decrease in life expectancy can be related to the emissions of carbon dioxide (CO_2). (Murthy et al. 2021)

Wang et al. (2020) considered the role of financial development as a possible determining factor. They analyzed data from 1972-2017 using autoregressive distributed lag (ARDL) in a study carried out in Pakistan. The findings showed that increased financial development and energy consumption can shorten people's lives. This is due to the fact that increased environmental degradation is a direct result of increased energy consumption. Life expectancy is also strongly influenced by economic growth in Pakistan.

From 1975 to 2013, Albiman et al. (2015) have studied Tanzania's energy consumption, GDP growth and emissions. The study found that energy consumption and economic growth can affect CO_2 emissions, as determined by a battery of tests including the Toda and Yamamoto non-Causality and Variance Decomposition.

Economic growth (GDP), carbon emissions (CO_2), and life expectancy in Turkey are studied using long time series data from 1960 to 2018, as well as the Bayer-Hanck cointegration test, an overlapping generational model, wavelet coherence, Breitung-Candelon frequency-domain spectral causality tests and Fourier Toda-Yamamoto test. In contrast to the existing literature, we discover a positive correlation between LE and GDP across time scales, a causal relationship between CO_2 and LE and a bidirectional causality between LE and GDP in the long, medium and short run. Similarly, GDP has medium as well as long run causal relationships with LE, while LE has long, medium and short run causal link with GDP (Cristi et al. 2021).

Alam et al. (2020) evaluated the impact of financial development on Bangladesh's significant increase in life expectancy between 1972 and 2013. Using the ARDL bounds testing approach, the study demonstrated a long-term positive relationship between financial development and life expectancy, implying that developments in the financial sector can help to raise life expectancy. Alam et al. (2015) found that financial development, economic growth, and education expenditure all significantly and favorably impact on life expectancy in India. Uddin et al. (2023) conducted a study focusing on the factors that influence life expectancy in Asian countries such as Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka from 2002 to 2020. The study revealed that factors such as good institutional quality, financial development, and increased health expenditure have a positive impact on life expectancy by contributing to longer life spans. Hendrawaty et al. (2022) examined the connection between economic growth and life expectancy within ASEAN nations, exploring how financial development and energy consumption influenced this relationship. They found that financial development has a long-run significant effect on life expectancy in ASEAN countries.

Food production significantly impacts life expectancy in selected Economic Community of West African States (ECOWAS) countries. An increase in the food production index resulted in a 0.46% rise in life expectancy, as per the study (Imoagwu et al., 2023). In a study conducted by Nzeh in 2023 examined the relationship between food production and life expectancy in low-income African food-deficit countries. The study utilized various panel models, including dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS), to analyze the impact of the food production index on life expectancy. The findings indicated that food production positively and significantly affected life expectancy.

The study on the determinants of life expectancy in Bangladesh has a research gap due to the limited utilization of advanced time series models, specifically the Vector Error Correction Model (VECM). These models are crucial for comprehensively capturing the intricate and evolving connections between economic growth, carbon emissions, and other factors that influence life expectancy. Prior research frequently overlooked the thorough examination of environmental elements, exhibited a lack of effective integration between economic and environmental viewpoints, and omitted the utilization of cointegration analysis to evaluate potential long-term equilibrium linkages among variables. The selection of VECM for this research is justified by its ability to capture dynamic and long-term relationships, rectify short-term deviations and offer practical policy insights. Consequently, this choice addresses the existing gaps in literature and contributes to a comprehensive comprehension of the determinants influencing life expectancy in Bangladesh.

3. Methodology

3.1 Sources of the Data

Using time-series data spanning 1974-2020, this study explored the causal influence of food production, financial development, CO2 and economic growth on life expectancy in Bangladesh. To check for normality across all series, the current study converted all variables to natural logarithms. Life expectancy (LE) is the dependent variable in this analysis, while RGDP, CO2 emissions, population growth, financial development and food production are the explanatory variables. The data used came entirely from the World Bank's 2022 database. Here, Real GDP is the proxy for the economic growth and financial development is typically measured by the proportion of domestic credit to the private sector relative to GDP. Food production is measured by food production index which covers edible food crops containing nutrients, excluding coffee and tea due to lack of nutritive value.

The variables are described as follows:

Table 1: Variables Nature

Variables	Form of Variable	Sources
Life Expectancy (LE)	Natural log of LE	WDI
Real GDP (GDP)	Natural log of GDP	WDI
Carbon Emission (CO2)	Natural log of CO2	WDI
Financial Development (FD)	Natural log of FD	WDI
Food Production Index (FP)	Natural log of FP	WDI
Population Growth (PG)	Natural log of PG	WDI

The model we tested in these papers is given below

$$\mathrm{lnLE_t} = \alpha_0 + \alpha_1 \mathrm{lnGDP_t} + \alpha_2 \mathrm{lnCO2_t} + \alpha_3 \mathrm{lnFD_t} + \alpha_4 \mathrm{lnFP_t} + \alpha_5 \mathrm{lnPG_t} + \epsilon_t$$

3.2 The Analysis Tool

Methods used for collecting and analyzing data are covered here. Stationarity testing, cointegration testing are just some of the estimations and tests that are performed in this research.

3.2.1 Stationarity Tests

Nonstationary is common in time series. Nonstationary data causes spurious regression. Stationarity tests must be performed as the initial stage in this empirical study to establish the order of integration of series.

3.2.2 Johansen Cointegration Test

The Johansen test is operated to examine the cointegration of a number of non-stationarity time series data. The Johansen test, unlike the Engle-Granger test, permits multiple cointegrating correlations. The Maximum Eigenvalue test and the Trace tests are the two basic variations of Johansen's test.

Eigenvalue is identified as a non-zero vector that changes by a scalar factor when subjected to a linear transformation. Similar to Johansen's trace test is the Maximum Eigenvalue test. The null hypothesis is the main difference between the two. Trace tests estimate the number of linear combinations in a time series data, i.e., K to be equal to the value K_0 and the hypothesis for the value K to be greater than K_0. The VECM will be specified based on the results of the Johansen co-integration test. The VECM includes an error correction term to capture the long-run equilibrium relationship among the variables. Here is the equation,

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-k} + \epsilon_t$$

ΔY_t represents the vector of differenced variables at time, Π and Γ_i denotes the matrix of long run and short run coefficients respectively.

4. Result Analysis and Discussion

4.1 Descriptive Statistics

The parameter used in this paper is described in Table 1. Log of Emissions of carbon dioxide (CO2) range from 8.44 to 11.43; log of life expectancy is 3.89 to 4.28; and log of gross domestic product (GDP) is ranging from 24.09 to 26.309; and so on. In addition, the used parameters have a skewness that is very close to zero. Results from tests for skewness and kurtosis are consistent with the idea that our data follow a normal distribution. All the parameters, in particular, are very close to zero, which is a sign of normal distribution. The p-value from the Jarque-Bera results addresses that all factors are normally distributed, with the exception of GDP, which does not follow a normal distribution.

Table 2: Descriptive Statistics

	Life Expectancy	Economic Growth	Carbon Emission	Financial Development	Food Production	Population Growth
	lnLE	lnGDP	lnCO2	lnFD	lnLFP	lnPG
Mean	4.107852	25.07756	9.920118	2.854715	4.040155	0.550717
Median	4.117849	24.99998	9.850614	3.020261	3.920785	0.629219
Minimum	3.895080	24.09228	8.446933	0.650824	3.419037	-0.127730
Maximum	4.287798	26.30961	11.43766	3.793396	4.720194	1.019984
Std. Dev.	0.127053	0.660858	0.893660	0.822549	0.410091	0.323638
Skewness	-0.141869	0.275265	0.150162	-0.932416	0.251218	-0.421506
Kurtosis	1.465367	1.891867	1.819662	3.109441	1.642808	1.993093
Jarque-Bera	4.769729	2.998290	2.904974	6.833756	4.101559	3.377207
Prob.	0.092101	0.223321	0.233988	0.032815	0.128635	0.184777
Sum	193.0690	1178.645	466.2455	134.1716	189.8873	25.88369
Sum Sq. Dev.	0.742552	20.08971	36.73687	31.12300	7.736044	4.818114
Obs.	47	47	47	47	47	47

4.2 Unit root test:

Integrated order is necessary for the VECM model. For VECM, the order of variables should be I(1). Unit root test is conducted by Augmented Dickey Fuller test. In ADF test all the series become stationary after 1st differencing at the 5% significance level. Thus, the variables are I(1). The summary of the variables which is conducted by the ADF test is given below.

Table 3: ADF Test

At Level							
		LLF	LGDP	LCO2	LFD	LFP	LPG
With Constant	t	-1.1063	4.2653	-0.0346	-2.7245	0.1081	-1.2160
	Prob.	***0.7056***	***1.0000***	***0.9502***	***0.0777***	***0.9630***	***0.6595***
With Trend & Constant	t	-1.5604	-1.4538	-1.9776	-1.8925	-2.0583	-3.4492
	Prob.	***0.7932***	***0.8310***	***0.5977***	***0.6422***	***0.5546***	***0.0576***
Without Trend & Constant	t	3.9620	8.4783	7.3266	2.0286	5.3508	-1.2570
	Prob.	***0.9999***	***1.0000***	***1.0000***	***0.9888***	***1.0000***	***0.1890***
1st Difference							
		d(LLF)	d(LGDP)	d(LCO2)	d(LFD)	d(LFP)	d(LPG)
With Constant	t	-7.7157	-8.2832	-5.9057	-7.1500	-8.2248	-3.8134
	Prob.	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0054***
With Trend & Constant	t	-7.6936	-11.5360	-5.8307	-8.8256	-8.2872	-3.7731
	Prob.	***0.0000***	***0.0000***	***0.0001***	***0.0000***	***0.0000***	***0.0274***
Without Trend & Constant	t	-3.0144	0.0166	-3.3593	-5.7978	-1.7500	-3.7649
	Prob.	***0.0034***	***0.6826***	***0.0012***	***0.0000***	***0.0760***	***0.0004***
Decision		**I(1)**	**I(1)**	**I(1)**	**I(1)**	**I(1)**	**I(1)**

4.3 Johansen Cointegration Test:

After establishing that all series are stationary, we can move on to the cointegration test, which determines if the linear combination of the variables is stationary or if the variables are in some kind of equilibrium or long-term relationship.

The following tables show the outcomes of Johansen cointegration according to the Trace and Max eigen test.

Table 4: Outcomes of Cointegration Test (Trace Test)

Rank Test of Unrestricted Co-integration (Trace Test)				
Hypothesized No. of CE(s)	Trace Statistic	Eigenvalue	Critical Value (0.05)	Probability

$H_0: r = 0$ *	119.9801	0.579519	95.75366	0.0004
$H_0: r \leq 1$ *	80.99417	0.478327	69.81889	0.0049
$H_0: r \leq 2$ *	51.71201	0.432408	47.85613	0.0208
$H_0: r \leq 3$	26.22617	0.293809	29.79707	0.1221
$H_0: r \leq 4$	10.57204	0.190400	15.49471	0.2393
$H_0: r \leq 5$	1.067384	0.023441	3.841466	0.3015

Table 5: Outcomes of Cointegration Test (Max-Eigen Test)

Unrestricted Co-integration Rank Test (Max-Eigenvalue)				
Hypothesized No. of CE(s)	Max Eigen Statistic	Eigenvalue	Critical Value (0.05)	Probability
$H_0: r = 0$	38.98598	0.579519	40.07757	0.0660
$H_0: r \leq 1$	29.28216	0.478327	33.87687	0.1604
$H_0: r \leq 2$	25.48585	0.432408	27.58434	0.0906
$H_0: r \leq 3$	15.65413	0.293809	21.13162	0.2457
$H_0: r \leq 4$	9.504653	0.190400	14.26460	0.2465
$H_0: r \leq 5$	1.067384	0.023441	3.841466	0.3015

The Johansen test implies that there are three cointegration among the variables at 5% level of significance regarding the trace test. And according to the Max-Eigen value test there is a only on cointegrating equation in the variables at 10% level of significance. Thus the test confirms that there will be a long term link among the variables. Here, the normalized cointegrating equation is given below.

Table 6: Normalized cointegrating coefficients

lnLE	lnGDP	lnCO2	lnFD	lnFP	lnPG
1.000000	-0.755309	0.418856	-0.268264	0.377048	-0.454200
	(0.38807)	(0.26591)	(0.06744)	(0.51330)	(0.15265)
				(standard error in parentheses)	

The above table shows the cointegrating equations. Here, if GDP rises in 1%, then the life expectancy will be risen by 0.76% with other variables are constant. If CO2 increases 1%, then the LE will reduce 0.42%, ceteris paribus. Also, 1% rise in FD will lead to increase the LE by 0.27% with other variables are constant. If food production increases 1%, then LE will reduce 0.38% as well as 1% increase in population growth will cause to reduce the LE 0.45% with other things remain constant. Here, GDP and CO2 are statistically significant to influence the life expectancy at 5%. Where financial development is highly significant to impact the LE.

5. Conclusion and Policy Recommendation

Our examination of the effect of population growth, financial development, CO2 and economic growth on life expectancy in Bangladesh demonstrates the need of tackling environmental concerns concurrently with economic progress. Life expectancy is adversely affected by carbon emissions, whereas economic growth has a positive impact. Yet, there is evidence of a trade-off between these factors, in which the positive effects of economic expansion on life expectancy are outweighed by the detrimental consequences of carbon emissions on life expectancy.

This comprehensive analysis of key statistics highlights the intricate relationship between various factors and life expectancy in Bangladesh. Notably, a 1% increase in GDP is associated with a significant 0.76% rise in life expectancy, underscoring the role of economic growth in improving living conditions. However, the concerning statistic is the 0.42% reduction in life expectancy for every 1% increase in carbon emissions (CO2), emphasizing the urgent need for effective environmental policies to mitigate pollution's adverse health effects. Additionally, the positive impact of financial development on life expectancy, with a 1% increase resulting in a 0.27% rise, reinforces the importance of accessible healthcare and education. Conversely, the alarming statistics reveal that a 1% increase in food production leads to a 0.38% reduction in life expectancy, emphasizing the need for sustainable agriculture practices. Lastly, a 1% rise in population growth correlates with a 0.45% decrease in life expectancy, underscoring the significance of population management strategies. In light of these statistics, a holistic, interdisciplinary approach is imperative for policymaking, aiming to enhance the population's well-being and longevity while preserving the environment.

The results indicate that Bangladeshi officials should prioritize reducing carbon emissions and encouraging sustainable development, as well as emphasizing investments in financial development and food production, to enhance the country's overall health. To shrink the negative impact of population expansion on life expectancy, it is necessary to establish policies that attempt to slow population growth, such as family planning and reproductive health education initiatives. Bangladesh must cut carbon emissions in order to increase the country's life expectancy. The government can foster the utilization of renewable energy resources, such as wind and solar power, and decrease dependency on fossil fuels. In addition, the government can develop laws that promote the adoption of energy-efficient technology and methods. Life expectancy is influenced favorably by economic development. Thus, the government should invest in the financial sector to enhance the nation's financial development. This can be accomplished through encouraging financial inclusion and expanding access to financial services such as credit and insurance.

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