

-RESEARCH ARTICLE-

LEVERAGING TECHNOLOGY FOR POVERTY ALLEVIATION AND ECONOMIC GROWTH IN SAUDI ARABIA IN ADDRESSING THE SDGS 1 AND 8 INITIATIVES

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—Abstract—

The paper provided a clear roadmap for how incorporating technology into the Saudi Arabian socio-economic systems can help reduce poverty in the Kingdom and improve indicators for decent work and economic growth. The paper aimed to provide a comprehensive review and evaluation of initiatives focusing on SDG 1 (no poverty) and SDG 8 (decent work, economic growth). Through a thorough analysis of stakeholders' viewpoints on the structure, aims, and outcomes of technological innovations in Saudi Arabia, the paper aimed to shed light on how technology impacts poverty reduction and economic development from a strategic perspective. Conducting a quantitative survey involved gathering data from 968 stakeholders in Saudi Arabia, such as government officials, technology experts, researchers, and ordinary citizens. This was done through a digitally designed questionnaire. Appropriate statistical measures were utilised to measure the items used for data collection. The measurement tools were based on prior research and underwent validation using appropriate statistical methods. The results showed strong convergent validity with values of 0.707 for economic growth and 0.621 for decent work. Additionally, the Cronbach's alpha and Composite Reliability values were satisfactory for economic growth ($\alpha = 0.862$, CR = 0.907) and decent work ($\alpha = 0.795$, CR=863). This study showcases the credibility of the measuring tools utilised to assess the effects of technology on poverty reduction, economic development, and employment in Saudi Arabia. After testing three hypotheses, it was found that the correlation between technological advancement and quality employment is 0.47, with a t-value of 3.92 and a p-value <0.001. A strong relationship is indicated by the statistically significant positive coefficient between technological progress and improvements in decent work conditions in Saudi Arabia. There is a correlation between technological innovation and economic growth, with a coefficient of 0.532 for advances in technology and economic growth (t-value = 5.06; p < .001). There is a clear link between technological advancement and economic prosperity in Saudi Arabia. There is a strong connection between technological advancement and alleviating poverty. Technology-driven concepts play a crucial role in addressing poverty, promoting economic growth, and creating decent employment opportunities, aligning with Vision 2030. It is suggested that the study's findings could be used to improve poverty alleviation strategies and economic prosperity by utilising technology in Saudi Arabia.

Keywords: Poverty Alleviation, Economic Growth, SDGs1 and 8, Technology.

INTRODUCTION

When examining sustainable development, two crucial SDGs are SDG 1 (No Poverty) and SDG 8 Decent Work and Economic Growth. SDG 1 presents a worldwide plan to eradicate poverty in all its forms, addressing the various obstacles that millions of individuals face daily. The focus is not only on income poverty but also on broader aspects of deprivation like education, healthcare, and basic infrastructure. Poverty continues to be a crucial subject in discussions on the socio-economic landscape of Saudi Arabia. The problem of poverty in Saudi Arabia has been widely overlooked. There have been connections made between poverty in Saudi Arabia and foreign workers from low-income countries, as suggested by [Alkhamis, Hassan, & Cosgrove \(2014\)](#) if it is indeed present. Assessing the level of poverty in the country is a challenging task due to the lack of consistent government data on poverty. Based on the latest government data, 19% of Saudi citizens were experiencing poverty in 2005. The calculation was based on the poverty threshold during that specific period, which was set at 5000 Saudi riyals (SAR) per individual per month (\$4.41 per person per day). Based on current independent sources, approximately 20% of the population in Saudi Arabia is currently living in poverty. SDG 8 emphasises the promotion of sustained growth that is inclusive and socially responsible, leading to full and productive employment. This vision envisions a world with numerous job opportunities that result in improved living standards and economic growth. These two SDG are closely connected, indicating a recognition of how poverty eradication and economic development support each other.

Connecting the global goals of SDG 1 and 8 to a local context, Saudi Arabia's Vision 2030 serves as a comprehensive roadmap for the country's transformation. Vision 2030, crafted by the Saudi Arabian government, is a strategic plan aimed at broadening the economy of the nation and decreasing reliance on oil while improving living standards.

Conversations about SDGs have typically focused on the broader concept of sustainability theory. After being introduced globally, the theory of sustainable development has gained considerable acceptance among development experts and commentators, who have been working to promote and spread it. Emphasising the overall productive capacities of a society, including physical and human capabilities, is crucial for development. In addition, the goal is to promote a just and equal sharing of advantages and a productive and effective utilisation of resources. Especially the infrastructures built with long-term viability and sustainability in mind, expanding such facilities is a key focus for the community in economic development. Through economic stability and a positive outlook on the future, individuals in a well-developed society experience overall wealth and sufficient resources for basic needs, education, healthcare, and leisure activities. Moreover, reliable sources are considered valuable assets for unexpected situations down the line. Economic progress is a result of ensuring

that all citizens have access to the existing amenities of a nation. One way to achieve this is by implementing fair employment policies, reducing poverty, and setting up systems for distributive justice, among other strategies. Moreover, it is crucial to tackle the class disparity in a way that prevents the continuous advancement of the wealthy at the cost of the impoverished, and guarantees intergenerational justice is also met.

Moreover, the social and cultural factors play a crucial role in this study. This dimension focuses on studying interpersonal relationships. Creating an ideal setting for the development of social security, housing, health, education, personal, and judicial security systems, along with interactive justice, is essential for promoting social progress. Being a citizen is a valued privilege in a well-developed society, where civic organisations actively participate in overseeing government performance and providing feedback. By examining the government system, these organisations make public control tangible and actual, thus playing a crucial role in regulating power within society.

Furthermore, the theory integrated a technological component that enables the exploration of additional dimensions through technological progress. This dimension covers a range of factors such as technological advancements, automation levels, workforce demographics, technical complexity, digital divide between urban and rural areas, socioeconomic status, age, gender, and technological progress. In a developed society, the gap between theory and practice decreases significantly from a scientific and technological perspective. Utilising knowledge in real-world scenarios is essentially ineffective.

It is crucial to highlight the accomplishment of achieving SDG 1 in Saudi Arabia and then emphasising the importance of also achieving SDG 8. Given the rapid socio-economic transformation in the Kingdom, it is crucial to find immediate solutions to address issues related to poverty and sustainable economic growth. In relation to SDG 1 and SDG 8, the pursuit of Vision 2030 - a comprehensive blueprint for diversifying the economy and ensuring sustainable development - aligns well with the objectives sought by these two goals. Eradicating poverty in all its forms and fostering inclusive economic growth with opportunities for all is not only a worldwide necessity but also a key goal for Saudi Arabia. In a society aiming to become knowledge-driven, utilising technology is essential. This paper aims to provide a comprehensive review and evaluation of projects related to SDG 1 (no poverty) and SDG 8 (decent work, economic growth). Through a thorough analysis of stakeholders' viewpoints on the program's structure, goals, and results, the paper aims to shed light on the strategic implications of the intersection between technology, poverty reduction, and economic development.

By following the guidelines in Kingdom and United Nations' SDG-RFP and including relevant literature, we aim to determine the potential impact of technology-driven

projects on Saudi Arabia. This paper thoroughly examines sustainable development, with a specific focus on the complex interplay between technology, poverty alleviation, and economic growth with decent work in the context of Saudi Arabia. By conducting a thorough analysis of stakeholders' viewpoints, the goal is to provide insights into how technology intersects with poverty reduction and economic development strategically. Conducting a quantitative survey with 968 stakeholders, including government officials and ordinary citizens, to analyse the structure, goals, and results of technological innovations. The data collected from a digitally designed questionnaire goes through thorough validation to guarantee the reliability of our measuring instruments.

Study Background

Amid economic evolution and global challenges, Saudi Arabia embarks on a transformative journey epitomised by Vision 2030. Conceived as a strategy to diversify the economy, this national agenda is dynamic and aims for sustainable economic growth. The complex challenges are further supported by the ambitious nature of this Kingdom. It aims to transition from a conventional oil-dependent economy to a knowledge-based economy. Navigating such a transition comes with a range of socio-economic complexities and requires intentional intervention. It aligns well with Sustainable Development Goal 1 (SDG 1) Addressing poverty is crucial, along with promoting decent work and economic growth as outlined in SDG 8. This seamless integration aligns well with the SDG. Technology is the foundation of projects aimed at poverty alleviation and economic development.

First and foremost, it is important to note that the collaboration between Saudi Arabia and the United Nations' SDG Programme can be seen as a form of implementation of this partnership. It focuses on projects that strategically use technology to address the 5Ps outlined in the SDG roadmap: Collaboration for the well-being of society and the environment. This article delves into the crucial background information, providing a detailed analysis of SDG 1 (ending poverty) and SDG 8 (decent work conditions). It explores the impact of technology on project development and research projects. It continues to analyse Vision 2030, which serves as the foundation for these. Through a systematic approach to local issues, this paper delves into applying the SDGs to Saudi Arabia and exploring technology's sector-specific applications in addressing poverty-related challenges.

This study is important for academic documentation as well as for implementing policies in the Saudi Arabian context and beyond. The research offered detailed information on utilising technology to improve poverty alleviation mechanisms and economic policies to support the achievement of the SDGs 1 and 8. Future research can build upon the practical data and statistical measures presented in this study to enhance discussions on evaluating SDG metrics and indicators in Saudi Arabia and other

regions. It is essential for key stakeholders at the government level to gather pertinent information for measuring SDGs 1 and 8 in relation to achieving Vision 2030 in Saudi Arabia. This study will assist in deepening their comprehension of the significance of these indicators and improving their strategies for advancing technology in the country, aiding them in transitioning from an oil-based economy to a knowledge-based one.

The remaining parts of the paper are organised as thus:

- 1 The following section offers a detailed analysis of key concepts in the paper, such as SDG 1 and SDG 8, the integration of technology, and summarising key results from prior research.
- 2 The third section provides an overview of the methodological aspects of the paper, covering the study approach, design, community, sampling, tools, and analysis procedures.
- 3 The fourth section provides both the data presentation and the analysis of the presented data.
- 4 In the final section, a concise summary and conclusion of the paper are presented, along with a brief documentation of the recommendations.

REVIEW OF RELATED LITERATURE

Studies on Correlation between Decent, Economic Growth and Poverty reduction; From International level to Saudi Arabian Context

The intricate relationship among decent work, economic growth, and poverty alleviation is a key focus in understanding Saudi Arabia's developmental landscape. [Albassam \(2021\)](#) delves into sustainable development by focusing on institutional enhancement. Institutions' quality impacts employment conditions and economic potential, making it closely linked to goal 8 (Decent Work and Economic Growth). Meanwhile, [Aziz & Sarwar \(2023\)](#) reevaluate governance indicators, highlighting their significant role in achieving sustainable economic growth along with poverty eradication following Saudi Arabia's implementation of Vision 2030. Additional analysis extends beyond the national level: [Ali et al. \(2018\)](#) provide valuable insights into achieving sustainable development goals within and among BRICS nations. Their research contributes to our understanding of the global situation and provides valuable comparative perspectives on the connection between quality employment, economic development, and poverty reduction. In the Arab region, a case study by [Allen et al. \(2017\)](#) highlighted the significance of indicators in evaluating progress. The connection between these indicators and the broader goals of targets 1 (No Poverty) and 8 is quite clear, providing a solid framework for assessing Saudi Arabia's progress.

The shift proposed by [Kreinin & Aigner \(2022\)](#) from focusing on "Decent work & economic growth" to "Sustainable work & economic degrowth" introduces a critical

perspective. This new way of thinking questions outdated concepts and prompts us to rethink the connection between quality work, economic development, and environmental responsibility. Related to this topic, [Leal Filho et al. \(2021\)](#) and [Letovská \(2021\)](#) delve into the intricacies of SDG8, particularly emphasising decent work. Their research sheds light on the concept, which advocates for full employment and social protection, while also exploring economists' perspectives on its influence on economic growth. The theoretical foundation here provides a strong basis for SDG 8; Saudi Arabian initiatives must align with global targets. Regarding the environmental aspect, [Shakoor & Ahmed \(2023\)](#) discovered in their empirical research that this connection is equally strong. Understanding how well-managed economic activities can contribute to combating poverty is a crucial takeaway from this broader viewpoint. The mentioned analysis of economic growth is elaborated by [Stoian, Monterroso, & Current \(2019\)](#), who investigate the impact of SDG 8 on forests and forest-based livelihoods, highlighting the complexity of the Sustainable Development Goals framework.

Furthermore, [Singh et al. \(2022\)](#) conducted a thorough quantitative analysis to explore the correlation between sustainable development goals, economic growth, and education in the context of Saudi Arabia. Through the analysis of extensive data using t-statistics, the study directly connects to SDG 1. Additionally, it is pertinent to economic development as the researchers demonstrate the significance of education and training. The results offer crucial information on the impact of investing in human capital on economic progress, providing valuable insights into promoting decent work and reducing poverty through education. The formulation above aligns perfectly with the broad goals of sustainable development. Furthermore, education and employment are consistently linked to economic prosperity. [Rahman & Qattan \(2021\)](#) examine how Vision 2030 is impacting green development, focusing on the healthcare industry and highlighting potential side effects on economic growth and poverty reduction. State capacity is highlighted as the crucial element for successfully reaching sustainable development goals, particularly in the context of health objectives. When considering the objectives of SDGs 1 and 8, it is especially important to ensure that improved outcomes lead to a workforce that is better equipped to combat poverty directly. This study offers a thorough definition of multi-dimensional abstraction within the context of sustainable development, reflecting the shift in objectives. It focuses on the intersection of healthcare and economic development through reducing poverty rates.

[Sayfayn \(2018\)](#) offers a historical perspective on sustainable development in Saudi Arabia. Examining the progress of sustainable development initiatives provides valuable perspective on the challenges related to achieving specific sustainable development goals. Thus, armed with this historical perspective, we can pinpoint issues that have long been recognised and also discover pathways to new levels of economic development without poverty. It provides a nuanced perspective on the dialogue by placing current initiatives in the broader framework of Saudi Arabia's developmental progress.

Successful Implementation of SDG 1 and 8 at the Global Level

Sustainable Development Goals (SDGs) are now a prominent focus on the global stage, emphasising the need to establish a sustainable global economic system. This involves examining poverty from various perspectives, such as income, food, and access to essential services. [Rahman & Qattan \(2021\)](#) exemplify a reference study that highlights the complex aspects of poverty reduction, particularly emphasising the significance of revitalising the healthcare system to attain SDG 1. Meanwhile, SDG 8 emphasises the importance of promoting decent work and economic growth. Its objectives focus on long-term, comprehensive, and environmentally friendly economic development; creating abundant and meaningful job opportunities; the general welfare of employees. Significant research has been conducted by [Frey \(2018\)](#) and [Kilani \(2020\)](#), delving into the intricacies of promoting sustainable economic development through supportive policies for decent work practices and their potential to alleviate poverty. These objectives, along with their associated goals, serve as a foundation for developing a comprehensive worldwide plan to combat poverty and promote economic development.

[Albassam \(2021\)](#) conducted a thematic analysis of key sentiments and critical views of main stakeholders, emphasising the significance of SDG in Saudi Arabia. The research made a valuable contribution to discussions about successful SDG implementation. The research supports the importance of robust institutional frameworks to promote sustainable development, aligning with efforts to advance towards the goals of eradicating poverty and promoting decent employment. [Albassam \(2021\)](#) highlights the importance of systemic transformations for successful implementation of SDGs due to his institutional focus. Indeed, governance structures play a crucial role in assisting individuals in overcoming poverty and fostering economic development. The Millennium Development Goals (MDGs) offer insights into how to accomplish the Sustainable Industry 2030 vision, according to Hickmann et al. Their finding is significant for SDGs 1 and 8, emphasising a holistic approach that adjusts. From an academic perspective, the study has presented compelling arguments in favour of localising the SDGs and improving international collaboration. This study aims to draw insights from previous endeavours and highlight key takeaways from international goal setting, contributing valuable insights to current dialogues on enhancing strategies to attain specific sustainable development goals.

[Shulla & Leal-Filho \(2023\)](#) delve into the discussion of achieving successful implementation of SDGs by proposing actions that could support the United Nations Agenda 2030. Their holistic approach aligns with the broad scope of Goals 1 and 8. It is essential to implement coordinated actions both before and after the 2030 deadline, as highlighted in the study's approach to time management. On a worldwide scale, it highlights the importance of tailored strategies to address poverty and boost economic growth. In a recent study by [Biglari, Beiglary, & Arthanari \(2022\)](#) regarding the

sustainable development goals, they raised concerns about the feasibility of achieving these objectives. The research investigates the feasibility of sustainable development goals and contributes a crucial viewpoint to the discussion. Challenging common perceptions of international initiatives to reduce poverty and boost economic development.

In a study by [Dhaoui \(2019\)](#), the focus is on the analytical and econometric approach to sustainable development goals, highlighting the specific challenges faced by MENA countries that may have broader implications. This information is crucial for the implementation of Sustainable Development Goals 1 and 8, as countries in the MENA region experience a unique pattern distinct from other developing economies. In her research on economic growth, full employment, and decent work under SDG 8, [Frey \(2018\)](#) introduces a human rights perspective to the global conversation on achieving these objectives. The research links decent work, a concept filled with ethical implications in SDG 8, to the wider goal of sustainable development. Through this ethical perspective, we gain a deeper insight into the worldwide impacts of Goals 1 and 8. It's essential to prioritise fair work conditions alongside economic growth.

Study Objectives

After examining various studies and analysing the implementation of SDGs 1 and 8 on a global scale, this paper will focus on the interconnected objectives that span different aspects:

- 1 Engaging local stakeholders, including community leaders and members, businesses, and governmental agencies on leveraging technology to reduce poverty and enhance economic growth in Saudi Arabia
- 2 Exploring the importance of stakeholders' partnership in the development and completion of critical projects in job creation, poverty reduction and economic development in Saudi Arabia.
- 3 To evaluate the impact of the project on the change in income level, employment rates, and access to basic services.

STUDY DESIGN, APPROACH AND METHODOLOGY

Study Design

This research utilised a cross-sectional survey design to investigate the impact of technological initiatives on the relationship between decent work, the national economy, and poverty reduction in Saudi Arabia. This cross-sectional design is ideal for capturing a current overview of technological interventions and their outcomes. The survey involved a diverse group of participants, including government officials, business leaders in technology, academia representatives, and individuals from various backgrounds who are or plan to be involved.

Study Approach

Utilising a quantitative research approach to gather dependable statistical data on the impact of technological advancements designed to reduce poverty and boost economic growth in alignment with Saudi Arabia's 2016 national goals related to Sustainable Development Goals 1 and 8, Survey techniques were utilised as a methodological tool in this context. Opting for a quantitative approach is based on the logical and objective presentation of structured, numerical ideas that facilitate statistical analysis and comparative generalisation. An academic survey can collect a wide range of data from a diverse group of participants. It offers a comprehensive view of how technological change impacts poverty, economic development, and other related factors. This method is ideal for meeting research needs that involve measuring variables and identifying patterns that are essential for establishing causal relationships between technological interventions, decent work, and outcomes at various levels of analysis. Furthermore, the quantitative method aligns with the need for statistical accountability. It offers a solid foundation for developing policy recommendations and implementing strategic initiatives to enhance technological advancements in Saudi Arabia, ultimately contributing to the achievement of SDG 1 (No Poverty) and 8 (Decent Work).

Study Community

The survey participants encompass a wide array of stakeholders engaged in developing and utilising technological initiatives to eliminate poverty and stimulate economic growth in Saudi Arabia. Within the academic community are government officials involved in policy making and implementation; business leaders introducing technology innovations, technology experts contributing to solutions development and deployment, and individuals directly impacted by these initiatives. Government officials offer insights into the regulatory and policy landscape, while business leaders and technology experts provide perspectives on various development and application area. It is crucial to involve individuals impacted by such measures in the research to gain insights into real-world consequences and issues encountered by the general public. This research encompasses a wide range of participants and considers various types of technology as more than just instruments. Its purpose is to provide a comprehensive overview, where quality work aligns with economic development and poverty alleviation trails closely behind.

Hypotheses

The following hypotheses were tested from the null dimension:

- 1 There is a correlation between technological advancements in Saudi Arabia and decent work.
- 2 There is a correlation between technological innovation in Saudi Arabia and economic growth connected to the Kingdom's Vision 2030.

3 There is a correlation between technological advancements and poverty reduction in Saudi Arabia.

Examining these hypotheses involves testing their validity in the context of implementing the SDCs 1 and 8, in connection with United Nations categories 1 and 3.

Sampling and Sampling Technique

The sampling strategy utilised a combination of stratified and random methods. Stratification was created to include stakeholders from various sectors: government, private industry, and non-profit organisations. To ensure a balanced and unbiased representation of various viewpoints, random sampling was utilised within each stratum. This cross-sectional survey design provides a comprehensive overview of the current situation in technical items within Saudi Arabia and how they impact specified SDGs. Through the use of a stratified and random sampling technique, the sample obtained accurately represents the entire population, allowing for broader applicability of the findings. The collected data has been quantified and is ready for statistical analysis. This should facilitate drawing dependable conclusions regarding the connections among technology, employment structures conducive to decent work, economic growth, and poverty alleviation. Engaged in this study were a total of 968 key stakeholders across the mentioned sectors.

Study Tools

A digitally designed survey questionnaire was utilised as the primary tool for gathering data from key stakeholders in the survey. The survey was meticulously designed to collect data on key variables such as the implementation and effectiveness of technical solutions, shifts in employment trends, and economic growth metrics (both overall average income figures and micro-level measures); poverty reduction activities. Quantitative data was collected using Likert scales and structured questions to analyse trends, correlations, and causation. The survey was carried out utilising digital platforms such as emails and social media handles to ensure convenience and achieve a high response rate.

Validity and Reliability Measures

The study's findings were carefully validated and made reliable through multiple measures implemented during the process. To establish the construct validity, great care was taken in developing a survey instrument, which involved expert reviews and pilot testing, as well as thorough literature reviews. The survey questions were carefully crafted to effectively capture the key aspects of interest, specifically technology-induced poverty reduction in Saudi Arabia, economic growth, and decent work. In addition, face validity was established through the alignment of survey items with the theoretical framework derived from the existing literature on sustainable development and SDGs. Content validity was ensured by incorporating various viewpoints and insights from stakeholders familiar with the local context.

Moreover, reliability measures were employed to guarantee the consistency and stability of the gathered data. To determine the internal consistency reliability of the constructs, Cronbach's alpha coefficients were calculated for all measures. We used composite reliability analysis to confirm the reliability of the constructs, which indicates the internal consistency of the measurement model. Furthermore, to guarantee the absence of multicollinearity issues in the regression analysis of this study, the variance inflation factor (VIF) values were assessed to confirm that none of the independent variables showed excessive correlation, thus enhancing the reliability of the results. Overall, by implementing strict validity and reliability measures, the study focused on ensuring accuracy and credibility in its findings to contribute to a broader comprehension of the impact of technological advancements on sustainable development in Saudi Arabia.

Data Treatment and Analysis Procedure

This study employs a rigorous and methodical approach to analysing data to extract meaningful conclusions from survey responses. The survey responses were inputted into a statistical software programme, providing top-notch data. Descriptive statistics, including measures of central tendency and dispersion, were computed to provide a concise overview of the data. Afterward, statistical methods of inference were utilised to analyse the relationships between important variables. These involved correlation analysis and regression analysis. Correlation reveals the connections between technological programmes and various factors such as decent work, economic growth, and poverty reduction. We will assess the impact of technology-driven interventions on these outcomes through regression analysis, while also considering relevant covariates. Prior to obtaining the results, the significance level was established to ensure their reliability. Throughout the analysis, we employed thorough statistical tests and validation techniques to ensure the credibility of our results. An in-depth analysis was conducted on the connection between decent work, economic growth, and poverty reduction due to extensive research.

Ethical Considerations

Ethical considerations played a crucial role in guiding the research process at every stage. It was a concern that ensured the integrity and safety of participants throughout the study duration. To ensure ethical standards were upheld, all participants were asked for their consent before participating in the study. They were informed about the research's purpose, the voluntary nature of their participation, and the confidentiality of their responses. Furthermore, measures were implemented to safeguard the privacy and confidentiality of participants, with all data securely stored and restricted to authorised researchers. In addition, steps were implemented to minimise any potential risks or discomfort for the participants, who were also given the option to withdraw from the study without facing any consequences. Moreover, the

research methods adhered to ethical standards and principles set by institutional review boards and other regulatory agencies. By prioritising ethical principles throughout the study, we were able to ensure that all individuals participating in the research were treated with respect and dignity in accordance with their rights and well-being.

RESULTS

Results of Demographic Data

Several demographic characteristics were assessed during the study procedures, deemed important in relation to the research. Below is a summary of the results in [Table 1](#).

Table 1: Results of Demographic Features.

Category	Variable	Frequency	Percentage
Age	Below 30	93	9.6%
	30-39 years	221	22.84%
	40-49 years	375	38.73%
	50 years and above	279	28.82%
Gender	Male	395	40.71%
	Female	573	59.29%
Group	Government officials	225	23.24%
	Technology experts	185	19.11%
	Researchers	127	13.11%
	Ordinary citizens	431	44.54%
Impact Value	Direct beneficiary of technology enhancement	628	64.88%
	Policy makers	340	35.12%

Participants were selected from a diverse range of individuals in the Saudi Arabian population, and their demographic characteristics are displayed in this table. The distribution by age demonstrates a diverse range, with 9.6% under 30 years old, 22.84% between 30 and 39, 38.73% from 40 to 49, and a significant portion aged fifty or older. The gender distribution in the study was balanced, with 40.71% male and 59.29% female respondents. The participants were categorised into various groups, such as government officials (23.24%), science and technology specialists (19.11%), researchers (13.11%), and ordinary citizens making up the largest percentage. From the perspective of stakeholders, this design provides a comprehensive view from multiple angles. Considering the impact of technological advancements, 64.88% were identified as direct beneficiaries and 35.12% were policymakers. The results confirm a comprehensive sample and valuable insights gathered from a diverse group of individuals, offering substantial data for a comprehensive assessment of the impact of technological advancements on key indicators like decent work, economic growth, and poverty reduction.

Measuring Variables

Investigating the effects of technology on poverty reduction, economic growth, and decent work involved creating measurements from various sources and using standard notations to ensure the accuracy and consistency of the results. Here is a summary of the measuring items in the table below:

Table 2: Measuring Items.

Variable Constructs	Number of items	Notations	Literature Sources
Technological Impacts on Poverty Reduction	5	TiPR1 to TiPR5	Singh et al. (2022)
Technological impacts on Economic Growth	5	TiEG1 to TiEG5	Allen et al. (2017)
Technological Impacts on Decent Work	5	TiDW1 to TiDW5	Stoian et al. (2019)

Note: Ti = Technological impacts; PR= Poverty Reduction; EG= Economic Growth; DW= Decent Work

In [Table 2](#), it is shown that three key variables were fundamental in determining the measuring items. Five measuring items were developed in three separate studies to assess the impact of new technology on various variables, viewed through the lens of SGD1 and 8, as well as United Nations categories 1 and 3.

Constructs Reliability Measures

Analysis for this research involved conducting tests to assess the internal consistency and reliability of the data. The assessments involved calculating average variance extracted (AVE), Cronbach α , composite reliability (CR), and collinearity statistics (VIF) test. [Table 3](#) provides a summary of the findings.

The reliability analysis was conducted to evaluate the consistency and stability of measurements related to poverty reduction, economic growth, and decent work. When it comes to reducing poverty, all five items showed strong factor loadings (0.728 to 0.931), indicating a high correlation between the observed variables and their respective factors. Having an AVE of 0.679 that surpasses the suggested threshold of 0.5, it shows a strong convergent validity for poverty reduction efforts in Saudi Arabia. The Cronbach's alpha (α) and Composite Reliability (CR) values exceeded the acceptable thresholds. Therefore, these three indicators demonstrate the reliability of

poverty reduction measurements. The factor loadings for the constructs of economic growth (TiEG1 to TiEG5) and decent work (TiDW1 to TiDW5) were strong, with values between 0.766 and 0.92 for economic growth and 0.742 to 0.884 for decent work. Every construct surpassed the AVE threshold, with economic growth at 0.707 and decent work at 0.621, indicating satisfactory convergent validity. The Cronbach's alpha and Composite Reliability values for economic growth were $\alpha = 0.862$ and $CR = 0.907$, while for decent work they were $\alpha = 0.795$ and $CR = 0.863$. The results presented confirm the accuracy of the measuring tools utilised to assess the effects of technology on poverty reduction, economic development, and employment in Saudi Arabia.

Table 3: Constructs Reliability.

Factors	Notations	Factor Loading	AVE	Cronbach α	CR
Factor 1: Poverty Reduction	TiPR1	0.839	0.679	.843	.894
	TiPR2	0.728			
	TiPR3	0.931			
	TiPR4	0.812			
	TiPR5	0.801			
Factor 2: Economic Growth	TiEG1	0.843	0.707	.862	.908
	TiEG2	0.815			
	TiEG3	0.902			
	TiEG4	0.793			
	TiEG5	0.766			
Factor 3: Decent Work	TiDW1	0.884	0.621	.797	.868
	TiDW2	0.819			
	TiDW3	0.742			
	TiDW4	0.755			
	TiDW5	0.837			

Note: Note: Ti = Technological impacts; PR= Poverty Reduction; EG= Economic Growth; DW= Decent Work; Average Variance Extracted (AVE), and Composite Reliability (CR).

Table 4: Result of the Collinearity Statistics (VIF): “Outer VIF Values”.

Items	VIF
TiPR1	1.927
TiPR2	1.728
TiPR3	2.394
TiPR4	1.792
TiPR5	2.308
TiEG1	1.897
TiEG2	2.764
TiEG3	1.877
TiEG4	1.519
TiEG5	1.718
TiDW1	1.662
TiDW2	1.811
TiDW3	1.736
TiDW4	1.537
TiDW5	1.964

To examine potential multicollinearity among the measured constructs, collinearity statistics (as represented by Variance Inflation Factor [VIF] values) were performed, as contained in [Table 4](#) above. The VIF values for each item under the constructs of poverty reduction (TiPR1 to TiPR5), economic growth (TiEG1 to TiEG5) and decent work (TiDW1-TiDW5) are all below that commonly recommended threshold level 5. The variables show low multicollinearity, allowing for a reliable interpretation of the relationships between technological impacts on poverty reduction, economic growth, and decent work without concerns about collinearity-related distortions. The VIF values, ranging from 1.59 to 2764, consistently demonstrate the stability and reliability of the regression coefficients estimated in this model. This study offers additional support for the robustness of the findings regarding the impact of technological initiatives on poverty reduction, economic growth, and decent work in Saudi Arabia.

Test of Hypotheses

Three hypotheses were formulated to investigate the effects of technological advancements on poverty reduction, economic growth, and decent work in Saudi Arabia. The table below summarises the results of the test hypotheses.

Examining the correlation between technological progress and quality of work in [Table 5](#), the impact of technological advancement on enhanced quality is 0.47, with a t-value of 3.92 and a p-value <0.0. The significant positive coefficient indicates a robust correlation between technological advancement and the enhancement of decent work

conditions in Saudi Arabia. Hence, supporting this hypothesis implies that the Kingdom's investment in technological innovation has positive effects on working conditions, job opportunities, and overall labour market outcomes. It aligns seamlessly with the goals of Vision 2030.

Table 5: Test of the Correlations (Regression table for HP1).

	Coefficient	Standard Error	t-value	p-value
Interception	0.35	0.008	4.38	<0.001
Impact of technological advancement on decent Work in Saudi Arabia	0.47	0.012	3.92	<0.001

Table 6: Regression Table for HP2.

	Coefficient	Standard Error	t-value	p-value
Intercept	1.248	0.303	4.118	<0.002
Impacts of technological advancements on economic growth in Saudi Arabia	0.532	0.105	5.066	<0.001

In [Table 6](#), the analysis examines the correlation between technological innovation and economic growth. The coefficient for advances in technology and economic growth was found to be 0.532 (t-value = 5.06; $p < .01$). This demonstrates a robust positive relationship between technological advancement and economic expansion in Saudi Arabia. In simple terms, the support for this hypothesis highlights the crucial role that technology will have in realising the goals of Vision 2030 related to economic growth, diversity, and sustainability.

Table 7: Regression Table for HP 3.

	Coefficient	Std. Err	t-value	p-value
(Intercept)	0.3021	1.2766	5.492	<0.002
Impacts of technological advancements on poverty reduction in Saudi Arabia	1.4001	0.4357	6.669	<0.004

The correlation between technological advancement and alleviating poverty is illustrated in [Table 7](#). Regarding the influence of technological advancements on poverty reduction, the coefficient is 1.4001, the t-value is 6.669, and the p-value is less than 0.04. The strong positive coefficient indicates a robust relationship between technological progress and the reduction of poverty. It highlights the significance of technology-driven concepts in addressing poverty and aligns with Vision 2030.

All three hypotheses have been accepted. It is evident that in terms of work quality, economic development, and alleviating poverty in Saudi Arabia, there is a faction that views technology as highly advantageous. These findings highlight the importance of further investment in technology as a strategic tool to achieve these social and economic goals.

DISCUSSION OF FINDINGS

This paper has delved into the exploration of SDG1 and 8 in connection with the United Nations' categories 1 and 8. It has conducted a detailed analysis to explore the correlation between technological innovations and poverty reduction, decent work, and economic growth in Saudi Arabia. We conducted regression analysis to test three hypotheses. The findings from the regression analysis for the first hypothesis, examining the relationship between technological advances and decent work in Saudi Arabia, align with various studies cited in the reference list. As per Albassam's research from 2019, for sustainable development to become a reality in Saudi Arabia, institutions must undergo additional enhancements. The study's findings revealed a positive correlation, aligning with Albassam's emphasis on institutional quality. Improved technology typically enhances institutions' efficiency and effectiveness across various fields as well as in education as [Alshraah, Aly, & Alqasem \(2023\)](#) stated that "globalization blurs geographical boundaries and technology enhances communication across cultures, the demands placed on foreign language educators have grown exponentially". As a result, they offer superior work environments. To make advancements towards sustainable development goals, [Allen et al. \(2017\)](#) and [Stoian et al. \(2019\)](#) highlight the significance of indicator-based assessments. The coefficient in [Table 5](#) shows a positive value. Technological advancements are clear indicators of progress and contribute to creating better job opportunities, ultimately aligning with SDG 8. [Kreinin & Aigner \(2022\)](#) discuss the idea of shifting from "Decent work and economic growth" to "Sustainable work and economic growth". The study highlights a strong correlation indicating that advancements in technology can drive the creation of stable job opportunities, crucial for ensuring a sustainable economy in the future. In their study, [Leal Filho et al. \(2021\)](#) analyse the intricacies of decent work and economic growth. The study's positive coefficient further supports the idea that technical progress plays a crucial role in achieving both decent work and economic growth simultaneously.

Moreover, the strong connection found here aligns perfectly with the overarching story of how sustainable development, driven by advancements enabled by technological growth, results in enhancements for the job market and workplace conditions. In a recent study, [Singh et al. \(2022\)](#) investigated the impact of sustainable development goals on economic growth in Saudi Arabia, with a specific focus on education and training. The strong connection illustrated in [Table 5](#) aligns with their findings, indicating that advancements in technology support the necessary education and training that will increase job prospects. Examining these studies provides a comprehensive understanding of how technological advancements impact well-compensated employment in Saudi Arabia, highlighting its complex nature. It is evidently connected to global sustainability objectives for sustainable development.

The positive coefficient for technological change's impact on economic growth in Saudi Arabia aligns with results from numerous other studies, as shown in [Table 6](#). [Galli et al. \(2018\)](#) emphasise that sustainable development goals can only be accomplished by considering the global perspective and acting at the local level. The results of the study align closely with these findings. They contribute to providing scientific evidence that technological advancements can boost economic growth in local communities and make a significant impact on a broader scale. In the study by [Hickmann et al. \(2023\)](#), the authors examine the insights gained from establishing worldwide objectives for sustainable development, reflecting on the Sustainable Development Goals. The positive finding in this current paper aligns with their emphasis on global success factors, indicating that technological advancement is crucial for economic growth in today's sustainability-focused environment.

Furthermore, [Khan et al. \(2022\)](#) investigated the effects of financial inclusion on economic growth, poverty reduction, and sustainability. Based on their research, there is a clear connection between the advancement of technology, especially in terms of financial inclusion, and its positive impact on economic growth. [Shulla & Leal-Filho \(2023\)](#) discussed measures for achieving the Sustainable Development Goals by 2030. The presence of a positive coefficient in [Table 6](#) indicates the necessity of technological progress to meet the economic growth targets outlined by certain SDGs. In 2021, Tremblay and colleagues supported a comprehensive approach to planning for sustainability implementation at the local level. The study's findings highlight a positive correlation that aligns well with their systematic approach, considering both local-level and systemic effects. Technological advancements have a significant impact on economic growth at a grassroots level.

The coefficient in [Table 7](#) for the impact of technological progress on poverty reduction has significant implications. [Rahman & Qattan \(2021\)](#) explore the impact of the Vision 2030 programme on improving healthcare for underprivileged individuals in Saudi Arabia, emphasising the importance of comprehensive strategic planning in addressing

poverty. The positive coefficient supports the notion that advancements in technology help alleviate poverty by enhancing healthcare and general well-being. The study's findings align with the emphasis on achieving goals efficiently, highlighting the significant role of technological advancements in combating poverty.

In the MENA region, [Kilani \(2020\)](#) covers sustainable development goals, extractive industries, and the energy-nexus. The positive coefficient aligns with their research, indicating that the rise in technology and energy levels has helped decrease poverty in this area. [Rahman and colleagues \(2020\)](#) provide insight into the progress of Sustainable Development Goals in the Asian context. Their study demonstrates a positive correlation, which aligns with the findings of the current research. Technology has been instrumental in supporting poverty reduction initiatives across Asia. Based on extensive data analysis, [Salvia, and colleagues \(2019\)](#) investigate the patterns in Sustainable Development Goals research, addressing issues at both local and global levels. Supporting their claim is the positive coefficient found in [Table 7](#), which indicates that technological progress can help reduce poverty locally and globally. [Shakoor & Ahmed \(2023\)](#) delve into the sustainable development goals and economic growth in chosen SAARC nations.

The study's positive correlations align with their results, indicating that environmentally sustainable technologies contribute to poverty reduction. In a recent study, [Singh, and colleagues \(2022\)](#) examined how sustainable development goals influence economic growth in Saudi Arabia, focusing on education and training. The affirmative coefficient in [Table 7](#) validated their discovery that technological advancements positively affect poverty reduction by creating more education and training opportunities. [Stoian et al. \(2019\)](#) explore SDG 8, focusing on the potential impact on forests and forest-dependent livelihoods. Their research shows a positive correlation, indicating that advancements in technology can help alleviate poverty by creating more job opportunities. These studies emphasise the significant impact of effectively implemented technological innovation in combating poverty and enhancing quality of life.

In the MENA region on sustainable development goals, extractive industries and energy-nexus are covered by [Kilani \(2020\)](#). The positive coefficient agrees with their investigation, showing that increasing the level of technology and energy has reduced poverty in this region. The report from [Rahman et al. \(2020\)](#) gives us a glimpse of SDG progress in the Asian experience. Their research shows a positive correlation, which is precisely what we find in the current study. Technology has indeed been playing its part to aid poverty reduction efforts throughout Asia. Relying on Big Data, [Salvia et al. \(2019\)](#) examine trends in research of Sustainable Development Goals, covering both local and global concerns. Their argument that technological progress helps alleviate poverty on local and international levels is supported by the positive coefficient in [Table 7](#). Also, [Shakoor & Ahmed \(2023\)](#) explore the sustainable development goals,

economic growth in selected SAARC countries. The positive correlations in this study are in line with their findings, which show that environmentally sustainable technologies help to reduce poverty. Singh et al. (2022) assess the impact of sustainable development goals on economic growth in Saudi Arabia, particularly with respect to education and training. The positive coefficient in Table 7 confirmed their findings that technological improvements have a positive impact on poverty reduction through increased opportunities for education and training. Stoian et al. (2019) examine SDG 8, which includes decent work and economic growth that may harm forests or forest-dependent livelihoods. Their exploration correlates positively, meaning that technological progress can actually reduce poverty through opportunities for decent work. Together, these studies highlight that properly applied technological innovation can be a major weapon in the fight against poverty and will have far-reaching benefits for improving lives.

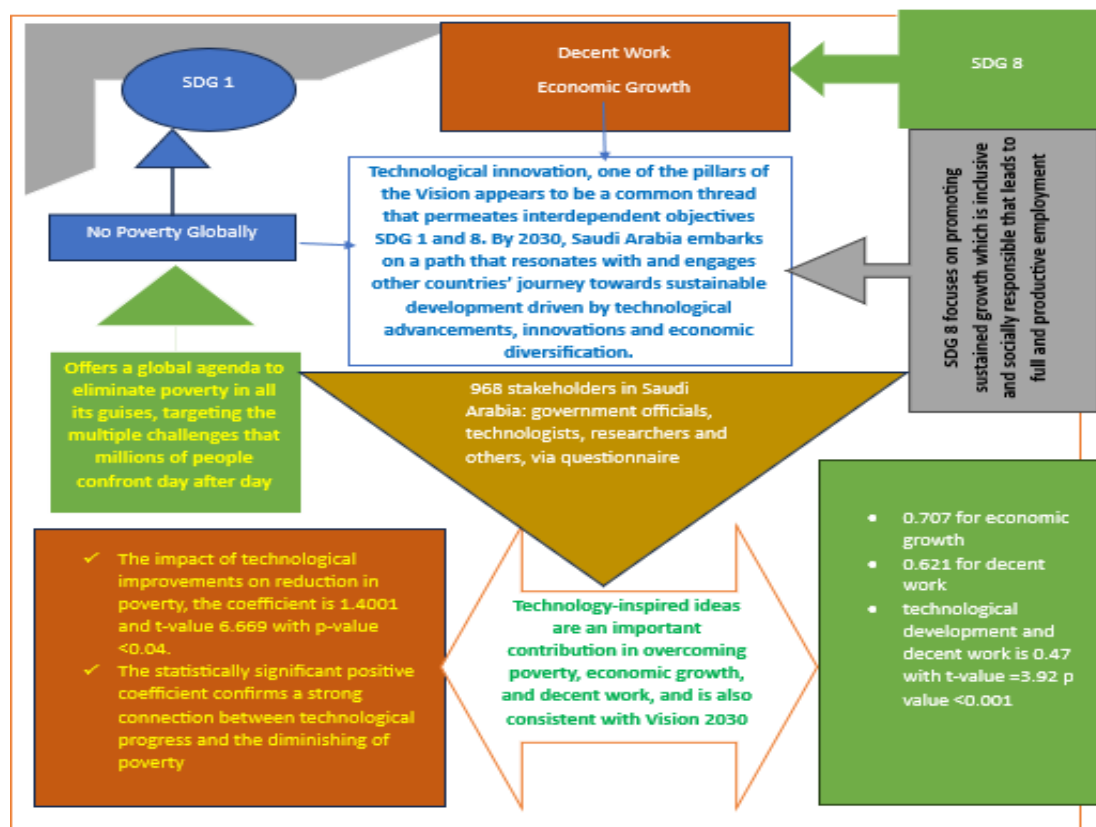


Figure 1: Graphical Abstract for SDG 1 and 8.

Aligned with Saudi Arabia's Vision 2030, aiming for comprehensive economic and social transformation, it is crucial to bridge the gap between Sustainable Development Goal 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). Vision 2030 has a vision of a thriving and equitable society, with the goal of eliminating poverty

through promoting economic diversification and creating jobs. The Kingdom is focused on empowering its citizens economically by ensuring access to decent work and sustainable livelihoods through strategic initiatives. By promoting entrepreneurship, improving education, and encouraging innovation, Saudi Arabia aims to develop a strong and varied economy, ultimately helping its citizens escape poverty and creating a prosperous and adaptable society. This integrated approach tackles poverty reduction and economic growth, showcasing the country's dedication to accomplishing the wider global sustainable development agenda.

CONCLUSION

This study aimed to investigate the intersection of technological advancements with their effects on poverty reduction, job creation, and economic growth in Saudi Arabia. Backed by a thorough examination of existing research and detailed statistical analysis, the results demonstrate a strong connection between technological advancements and key global development objectives such as poverty reduction and economic growth. Technology can contribute to sustainable industrialization, driving economic growth. The paper incorporated various studies from different perspectives to enhance our understanding of the relationship between quality employment and economic development on one side, and poverty reduction on the other, in light of technological advancements. This paper aligns with United Nations categories 1 and 3, strategically positioning itself within Saudi vision's dedication to SDG implementation. Throughout this study, the technological landscape in Saudi Arabia has been viewed through the lens of poverty alleviation and economic growth. In summary, the technological impacts emphasise that creative ideas and initiatives offer significant potential for steering the country towards achieving sustainable development objectives. This study aims to provide practical insights that are tailored to the local context and aligned with Vision 2030. It has been influenced by a broader international effort to promote sustainable development.

This paper has provided a valuable and scholarly contribution to the current discussion on SDG 1 and 8, offering empirical evidence of the positive effects of technological advancements in Saudi Arabia. The discussions and analyses have connected the discoveries with existing literature, providing readers with a comprehensive understanding of the intricate relationship between technology, poverty reduction, and economic development. In conclusion, this study has demonstrated how technology can serve as a catalyst for transformation. The findings align with the objectives of Saudi Arabia and United Nations goals of sustainable development. Striving to address poverty and promote economic development, as outlined in SDG 1 and 8, demonstrates our commitment to addressing social issues. As Saudi Arabia progresses on its developmental journey, the findings of this study offer valuable insights for policymakers and spark curiosity among researchers and practitioners.

The study's findings highlight practical and policy implications that could support the implementation of technological initiatives to address poverty alleviation and economic growth in Saudi Arabia. First and foremost, policymakers should prioritise investments in technology-intensive initiatives targeted at poverty reduction and promoting opportunities for decent work. This may involve implementing innovative initiatives to enhance digital skills training, promote entrepreneurship, and generate employment opportunities in emerging sectors such as information technology and renewable energy. Furthermore, it is essential to establish strategic collaborations among government entities, private organisations, and universities to leverage technology for fostering sustainable economic development. These collaborations would facilitate knowledge exchange, pooling of resources, and interventions tailored to the specific requirements of local communities. In addition, policymakers should create regulatory environments that support innovation and entrepreneurship to encourage companies to invest in technology-driven solutions that tackle socio-economic issues.

Furthermore, the research highlights the ongoing necessity for additional investigation and actions to enhance our understanding of the intricate connections between technology advancement, poverty alleviation efforts, and economic development. Other research could explore the long-term impacts of technological interventions on key factors such as employment, income, and quality of life. Furthermore, it is essential to integrate economic and social sciences like economics, sociology, and engineering to offer holistic solutions for sustainable development. Furthermore, researchers should prioritise studies that investigate the varying impacts of technological advancements on different demographics, including women and young people, to guarantee that interventions are considerate. Long-term studies that follow the development of technological projects over time are essential for monitoring patterns that could capitalise on new challenges and opportunities related to achieving the Sustainable Development Goals.

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