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EXPLORING THE IMPACT OF ECONOMIC SUSTAINABLE DEVELOPMENT GOALS ON ECONOMIC GROWTH: AN ANALYSIS OF SELECTED SAARC COUNTRIES

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Abstract

The United Nations Millennium Development declaration (2000) states a commitment “to making the right to development a reality for everyone and to freeing the entire human race from want”. Therefore, MDGs (2000-2015) primarily targeted developing countries' governments and were later replaced by the SDGs (2015-2030) having a global reach and targeting governments, businesses, and non-governmental organizations in both developed and developing countries. This study explores the impact of economic SDGs at disaggregated levels on economic growth (GDPGRO) with two dimensions environmental, and social goals. We have applied an ARDL (PMG) approach to panel data of selected SAARC (South Asian Association for Regional Cooperation) countries from 2000 to 2020 in this research. The results indicate the existence of a strong positive relationship between SDG8 (Decent work) and SDG17 (Partnership for global goals) on economic growth leading to job opportunities, reducing poverty, and inclusive growth. SDG9 (Industry, innovation, and infrastructure) and SDG10 (inequality) have a negative association with economic growth. Social sustainable development goals (SSDG) and Environmental sustainable development goals (ENSDG) have a negative correlation with economic growth. This may be due to increased spending on social programs. However, in the long run efficient implementation of environmental policies can reduce CO2 emissions thus positively enhancing economic growth. Policies targeting job creation, innovation, reducing inequality, partnership building, and promoting social and environmental goals are required to be implemented efficiently to ensure sustainable economic growth in these economies.

Keywords: SDGs, Economic Goals, Economic Growth, ARDL PMG, SAARC Countries

1. INTRODUCTION

In September 2015, all 193 UN member nations agreed to the Sustainable Development Goals (SDGs) as a way to combat global issues like poverty, environmental protection, and promoting prosperity for all people (Assembly. U, 2015). The Global Goals, also known as the Sustainable Development Goals, are relevant for both developed and developing nations despite the varying challenges from country to country (Citizenship, 2016). The 17 universal SDGs are backed by 169 specific targets and monitored by 231 unique indicators. The SDGs are intended to be achieved by 2030 and replace the previous Millennium Development Goals (MDGs), which had 8 goals and 21 targets and were in effect from 2000 to 2015. The MDGs primarily targeted developing countries' governments, whereas the SDGs have a global reach and target governments,

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businesses, and non-governmental organizations in both developed and developing countries (SDSN U, 2016).

The SDGs are built on the principle of universality, this means that everyone, regardless of their country or status, has a part to play in achieving them. The Global Goals give all nations the chance to safeguard the environment, eliminate poverty, deal with the impacts of climate change, decrease social inequalities, and enhance human well-being (UKSSD, 2018). To reach the SDGs by 2030, it's vital that all sectors of society, as well as all levels of government, incorporate the goals into their local planning process. Local government actions that align with the inclusiveness, universality, and equity principles of the SDGs are crucial in ensuring that no one is left behind. To localize the SDGs, local governments and key stakeholders will need to adapt, implement, and track the local-level targets of the SDGs. (Adams, 2017) believes that without collaboration between governments, private and public sectors, and civil society organizations, achieving the SDGs will be difficult. The 2030 SDGs, which include universal goals, targets and indicators, require the involvement of businesses, governments and civil society (UKSSD, 2018). To successfully achieve the 17 Sustainable Development Goals, business organizations need to play a role in both management and organizational reporting, as the SDGs are interrelated (Pizzi et al., 2020). The principle of "Leaving No One Behind" that forms the foundation of the SDGs implies that progress towards achieving the goals should be evaluated based on how well the most disadvantaged individuals and groups in society are improving in terms of their socio-economic development. This principle ensures that development is distributed equitably across all nations and demographic groups (UKSSD, 2018). The SDGs are transformative, and they aim to foster sustainable, inclusive, and sustained economic growth globally.

The ability to fully understand and achieve all the goals laid out in the Sustainable Development Goals (SDGs) is limited. The use of flexible weighting may lead countries to prioritize less demanding goals and neglect more important ones that require greater effort. This paper outlines the process for aggregating the SDGs, using the UN's interpretation of the goals and other relevant studies as a guide (Campagnolo et al., 2018; Clark et al., 2017; França et al., 2016; Lim et al., 2018; Clark et al., 2017). The 17 Sustainable Development Goals (SDGs) are grouped into three broad categories: Economic, Social, and Environmental (Huan et al., 2019). However, in this study, only the economic goals will be analyzed at a more detailed and disaggregated level, while the social and environmental dimensions will be considered at an aggregated level and included in the economic growth model. Economic sustainable development goals (ESDGs) are a set of 4 global goals adopted by the United Nations in 2015 decent work & economic growth, industry innovation & infrastructure, reduce inequality and Partnership for the global goals to protect the planet, and ensure that all people enjoy peace and prosperity.

The outbreak of COVID-19 caused a severe economic downturn, undoing progress made towards providing employment opportunities for all. Although the world economy began to recover in 2021, the recovery is still uncertain and fragile. This recovery varies greatly depending on location, industry, and demographics. Developed countries are seeing a

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stronger recovery while developing countries are still struggling with slow economic growth and job losses due to business closures. Small businesses, particularly those in low-income countries, are particularly affected, with limited resources to stay afloat. Those most impacted by the crisis, such as women, young people, and individuals with disabilities, are the last to recover. By the end of 2021, the global economic recovery was hindered by new waves of COVID-19, increased inflation, supply chain disruptions, policy uncertainty, and ongoing employment challenges. The ongoing conflict in Ukraine is projected to further impede global economic growth in 2022 (SDG Report, 2022). The COVID-19 pandemic has highlighted the significance of industrialization, technological advancement and robust infrastructure in rebuilding and achieving the SDGs. Economies with diversified industrial sectors and robust infrastructure such as transportation, internet connectivity, and utility services, have suffered less damage and recovered faster. In 2021, global manufacturing began to recover from the pandemic, but the recovery is still incomplete and uneven. In developing countries especially in the SAARC countries, the recovery has been slow and uncertain, with nearly one-third of manufacturing jobs being negatively impacted by the crisis. Women, youth, and low- and middle-skilled workers have been hit the hardest by the losses. Overall, industries that rely more on technology performed better and recovered faster, emphasizing the importance of technological innovation in achieving SDG 9 (SDG Report, 2022). Before the outbreak of COVID-19, there were indications that income inequality was decreasing, as in many countries, the incomes of the poorest people were rising faster than the average. However, inequalities still existed in other areas. The pandemic has now reversed any positive trends, and those with lower incomes are at risk of falling behind. The pandemic has also exacerbated structural and systemic discrimination. Developing countries and emerging markets are experiencing slow recoveries, leading to increased disparities in income between countries (SDG Report, 2022). Despite receiving a high amount of official development assistance and a rebound in global foreign direct investment and remittance flows, many developing countries are still struggling to recover from the pandemic. These countries are facing challenges such as high inflation, rising interest rates, and increasing debt. With limited resources and competing priorities, it is becoming increasingly difficult for these countries to recover economically. With the pandemic not yet over and a lack of vaccine distribution among countries, there is a risk of a "two-tiered" recovery. To effectively rebuild and achieve the SDGs, a significant transformation of the international financial and debt systems is necessary. The world is facing multiple crises in various sectors such as social, health, environment, and peace and security. To find lasting solutions, international cooperation must be increased urgently (SDG Report, 2022).

The South Asian Association for Regional Cooperation (SAARC) is an intergovernmental organization comprising of 8 member countries, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. All the SAARC countries have some commonalities, such as a shared history, culture and language. All these countries have a common heritage, and many are multi-ethnic and multi-lingual societies, which is a result of the long history of migrations, invasions, and cultural exchanges. Furthermore, all of the SAARC countries have a largely agrarian economy, characterized by small-scale farming and primitive agricultural production. In terms of religion, the majority of the

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population in SAARC countries is Hindu, with significant minorities of Muslims, Buddhists and Christians. Moreover, there is a deep-rooted traditional belief in astrology and spiritualism in all of the SAARC countries. In terms of history, SAARC countries have common experiences of colonialism, and all of them have made significant progress since their independence. Despite the political differences, SAARC countries are bound together by strong economic and cultural ties. The region has a large population and a rapidly growing economy, and many of the countries in the region are facing the challenges of poverty, unemployment, and inequality. To achieve sustainable economic growth in the region, it is important to focus on areas such as infrastructure development, education and skill development, and innovation and technology. Additionally, it is important to promote inclusive and equitable economic growth and to ensure that the benefits of economic growth are shared by all members of society. One of the main challenges facing SAARC countries in achieving sustainable economic growth is a lack of infrastructure and economic integration. Many of the countries in the region are landlocked and have limited access to ports and transportation networks. This makes it difficult to transport goods and services and limits the potential for economic development. To address this challenge, it is important to invest in infrastructure development, including regional and trans-border infrastructure, and to promote economic integration through trade and investment agreements. Another key challenge facing the region is a lack of access to affordable and reliable energy. Many of the countries in the region are heavily dependent on fossil fuels, which are a major source of greenhouse gas emissions and contribute to climate change (South Asian Association for Regional Cooperation, 2021).

This research delved into the correlation between economic sustainable development goals related to the economic dimension, namely SDG 8 (providing decent work and supporting economic growth), SDG 9 (industry, innovation and building infrastructure), SDG 10 (reducing inequality), and SDG 17 (Partnership for global goals), and economic growth in the SAARC region. Our discoveries add value to ongoing debates on the impact and effectiveness of economic sustainable development goals on economic growth in the developing countries. As far as our knowledge and the available literature goes, this is the first study to scrutinize the influence of economic sustainable development goals on economic growth in the SAARC region".

The paper is divided into five main sections with this section introducing readers to the theme under investigation. The next section of the paper presents a literature review. The third section presents SDGs construction, data collection and estimation methods. The fourth section presented empirical analysis and discussion. The final section consist on conclusion and policy recommendation.

2. REVIEW OF LITERATURE

The idea of sustainable development, though it may be interpreted differently by various groups and entities, should be incorporated throughout various industries and disciplines. The objective of sustainable development is to decrease the detrimental effects of human actions on the natural world, while simultaneously fostering economic and social

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progress. In order to establish a sustainable community, sustainable development should be viewed as a continual journey rather than a final destination, and should serve as the primary perspective for tackling worldwide issues (Robinson, 2004).

Economic growth is a factor in a country's standing in the global market, but sustainable development ensures that this standing is maintained over time. Sustainable development focuses not only on economic growth, but also on resource abundance, healthy living conditions, and social prosperity within the country (Caiado et al., 2019; Farelnik et al., 2021; Streimikiene & Ahmed, 2021). The 17 SDGs put forward by the UN General Assembly not only enhance but also maintain economic development, as well as promoting well-being and prosperity for the general public. These 17 SDGs are divided into categories of social, environmental, and economic development. The ESG score, which sets standards for evaluating and regulating the social, environmental, and corporate practices of companies, improves the social, environmental, and corporate performance of businesses and helps to achieve all 17 of the prescribed SDGs (Allen et al., 2018; Al-Refaie et al., 2020; Hussain et al., 2021).

A study by (Blagov & Petrova, 2021) examined the effects of economic growth on the attainment of the SDGs. The research suggested that in nations where economic growth is strong, advancements in technology occur rapidly, leading to improvements in infrastructure, transportation, communication systems, and production processes. As a result, economic growth aids in achieving the ninth SDG, which is related to the industry, innovation, and infrastructure. (Shahbaz et al., 2021) emphasized the achievement of the SDGs in the context of high economic growth. When the economy is expanding quickly, the production of goods and services within the economy tends to grow as well. This requires a large workforce to carry out the increased productive activity, which creates job opportunities and improves the living standards of workers through increased employment, wages, and bonuses. Therefore, a high economic growth rate contributes to achieving SDGs such as ending poverty and hunger.

Even though the SDGs are presented as separate objectives, they are actually interconnected and intertwined within a single framework. This provides nations and businesses with the chance to develop strategic policies and solutions that tackle multiple goals at once (Waage et al., 2015; Nilssonet al., 2016). The Sustainable Development Goals and their targets are interconnected, so progress made towards one goal or target can have an impact on other goals or targets as well. If policies and actions are not carefully planned, these interactions and trade-offs can have negative consequences (Bhaduri et al., 2016; Allen et al., 2019). The (Cambridge Institute for Sustainability Leadership CISL, 2017) investigated that, the SDGs are closely related to each other, and achieving any one of them alone is not possible. Additionally, the way we design and plan our buildings and cities affects every goal.

The SDGs are an important global policy document that outlines shared objectives for addressing challenges such as economic, social, and environmental issues. The key to consistency in policy for sustainable development is ensuring that the SDGs work together in harmony. The SDGs are interdependent and should not be viewed as one being more important than the others (UN SDGs, 2022; de Miguel & Laurenti , 2020).

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Therefore, progress towards one goal should not compromise efforts to achieve others (Robinson, 2004). In practice, it is both a significant challenge and a necessary requirement to create consistency across and within the wide-ranging policy areas covered by the SDGs (Nordbeck & Steurer, 2016; Mortensen & Petersen, 2017; Coscieme et al., 2020). Despite the shared objectives of the SDGs, implementation and success vary across nations due to the specific needs of each country (Warchold., et al 2021). The methods for attaining the SDGs that are practical in developed countries may not be the best approach for developing or underdeveloped nations (Kroll et al., 2019).

Previous studies on the relationship between GDP and SDGs have had inconsistent results, not just in developed countries, but also in developing economies (Tampakoudis, 2013; Adrangi & Kerr, 2022; Coscieme et al., 2020). These conflicting findings may be due to the specific country or region being studied, the amount of time-series data used, and the statistical models applied (Adam et al., 2017; Millia et al., 2021). Nevertheless, the SDGs established by the UN are a vital policy achievement in assessing environmental, social, and economic growth and guiding future developments in addressing global challenges (UN SDGs, 2022; Ripple et al., 2017).

(Tampakoudis, 2013) studied the relationship between GDP growth and SDGs at the country level in the Eurozone. The study found significant variations in the coefficients, which reflected the unique strengths and weaknesses of each nation based on their distinct socio-economic frameworks. The conclusion was that human needs require a new approach that combines economic development and environmental considerations. For example, several studies have shown that GDP growth rate has a positive correlation with industrialization (SDG 9) (Szirmai, & Verspagen, 2015; Elfaki et al., 2021) except for a few studies such as (Saba and Ngepah, 2022) who found a negative correlation and decent employment (SDG 8) (Singh et al., 2022; Jitsutthiphakorn, 2021). Studies also suggest that economic growth has a negative correlation with poverty (SDG 1) (Zhu et al., 2022; Onwuka, 2022) and hunger (SDG 2) (Wang & Taniguchi, 2002; Haynes, 2007), but research is divided on the effect of GDP on health (SDG 3). Some authors found a positive relationship between economic growth and health (Shafuda & De, 2021; Raghupathi V & Raghupathi W, 2020), while others found a negative relationship (Churchill et al., 2017; Alam et al., 2022). (Yang's, 2020) study in 21 developing countries revealed that the relationship between health and economic development varies depending on the level of human capital development. At low, medium and high levels of human capital development, there were significant negative, insignificant positive and significant positive relationships between health and economic development, respectively (Komarov etal., 2020).

Research suggests that the pursuit of economic SDGs (e.g., industrialization (SDG 9), decent employment (SDG 8)) may compromise the environment (e.g., climate change (SDG 13)) and social welfare SDGs (e.g., health (SDG 3)). During the peak of COVID-19, progress towards the SDGs was hindered, particularly in developing countries (such as Saudi Arabia), as economic (Komarov etal., 2020; Das & Bag, 2020; Tran et al., 2020; Barro et al., 2020), socioeconomic (Adam et al., 2020; Forsythe et al., 2020; Bartik et al., 2020; Borghouts et al., 20021), and health (Dhiman, 2021; Hossain, 2021; Field et al.,

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2021) goals deteriorated while environmental (Hu et al., 2021; Rana et al., 2021) goals improved. However, sustainable development requires that environmental protection, economic development, and social welfare should coexist (Tampakoudis, 2013).

3. METHOD FOR CONSTRUCTING THE SDGS INDEX

Normalization

The study will use min-max normalization method to make data comparable and non-dimensional (Lafortune et al., 2018; Nagy et al., 2018). The normalization process scales each variable from 0 to 100, with 0 being the worst performance and 100 the best. To eliminate extreme values, bounds for the best and worst values will be set, and then the min-max method will create a range of (0-100). Some indicators use high-value scores for good performance (e.g. employment to population ratio), marked with xˆ. For others, low-value scores indicate good performance (e.g. number of deaths due to disaster) marked with xˇ.

Aggregation of SDGs

After converting the data to a common, non-dimensional unit through normalization, we can evaluate the performance of each SDG in the SAARC countries by calculating the mean value for each SDG. This mean value serves as a score for each goal, and the method for determining these scores is as follows:

For the country "A" (Pakistan), suppose there is a Goal i (1 ≤ i ≤ 17), Goal i has R (R ≥ 1) indicators, in year Q (Q= 2000, 2001 . . . 2020), then the score of Goal i in year Q is A^{Q} Goal i ,

$$A^{Q}_{Goal,i} = \frac{A^{Q}_{Goal,i}\,(1) + A^{Q}_{Goal,i}\,(2) + \cdots + A^{Q}_{Goal,i}\,(R)}{R} \quad (1)$$

Where (i = 1, 2, · · ·, 17), (Q = 2000, 2001, · · ·, 2020), (R = number of indicators).

After calculating the scores of Goal i from 2000 to 2020 in turn, the study was get $A^{2000}_{Goal,i}$, $A^{2000}_{Goal,i}$, · · · , $A^{2020}_{Goal,i}$ for the country "A" (Pakistan).

For the other SAARC countries (B, C, D, E, F & G), after using the same steps, the study was able to get the scores of Goal 1 from 2000–2020 for each country.

This paper follows a two-step process for aggregating the SDGs. First, based on the UN's interpretation of normalization of the SDGs and the second is aggregation of SDGs given in relevant studies (referred to SDGs classification (Clark & Kavanagh, 2017; Campagnolo et al., 2018; Clark et al., 2017; Spaiser et al., 2017; Lim et al., 2018). The 17 Sustainable Development Goals are grouped into three broad categories: Economic, Social, and Environmental (Huan et al., 2019). The Economic dimension includes: SDG 8 (promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all), SDG 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), SDG 10 (reduce inequality within and among countries) and SDG 17 (strengthen the means of implementation and revitalize the global partnership for sustainable development); and

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the other two dimensions representing social and environmental goals are used in this study at the aggregated level with economic growth in the selected SAARC countries.

Data and Model Specification

The United Nations Statistics Division (UNSD, 2021) has data on 231 distinct indicators pertaining to 227 countries from 2000 to 2020. Afghanistan is not included in this study due to missing data of SDGs. Sustainable Development Goal (SDG) indicators are categorized, where relevant, by income, gender, age, race, ethnicity, migratory status, disability, geographical area, or other characteristics, as stated in the Basic Principles of the United Nations Statistics Division (UNSD, 2021). This research utilized country-disaggregated panel data of accessible SDGs indicators from 2000 to 2020 for selected 7 SAARC Countries. In this study, GDP growth rate (dependent variable) is used as a proxy variable for economic growth (GDPGRO) taken from the World Bank.

The specification of an appropriate model for the analysis is vital to identify relationships between the variables in the model. The empirical approach of this study consists of the following model:

$$GDPGRO_{i,t} = \beta_0 + \beta_1 Goal_{i,t}8 + \beta_2 Goal_{i,t}9 + \beta_3 Goal_{i,t}10 + \beta_4 Goal_{i,t}17 + \beta_5 SSDG_{i,t} + \beta_6 ENSDG_{i,t} + Ui,t \quad (2)$$

In the above model, we have used economic growth (GDPRO) as the dependent variable while the remaining variables i.e. four economic goals at disaggregated levels (Goal 8 "Decent work and economic growth", SDG Goal 9 "Industry, innovation and infrastructure", SDG Goal 10 "Reduce inequality", and SDG Goal 17 " Partnership for the global goals), Environmental Goals (ENSDG) and Social Goals (SSDG) used as an explanatory variable in the model, to analyze the relationship with economic growth for selected countries in the South Asian Association for Regional Cooperation (SAARC). In above equation 2, Uit represent the error term of the model. This approach allows us to consider multiple factors that can influence economic growth and development, and how these factors may interact with each other in different ways across different countries.

Econometric Methodology

Cross Section Dependence Test

The cross-sectional dependence test is a type of correlation that examines the interdependence of the error term among different countries of the panel data set. It is used to identify whether there is any relationship among errors in the cross-sectional unit. This study uses the Cross-Section Dependency (CD) test proposed by (Pesaran, 2004), which is based on pairwise correlation to compute the coefficients. This test is crucial for panel data as it checks if cross-sectional dependence does not exist. The first-generation unit root test is used for stationary data.

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{K=1}^{N-1}\sum_{L=K}^{N} P\hat{\ }kl\right)\_N(0,1) \quad (3)$$

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The correlation of OLS residuals of pairwise coefficients is represented by P^kl. The null hypothesis is that there is no cross-sectional dependence in the panel data, which must be acknowledged according to the equation.

Panel Unit Root Tests

The panel unit root tests are used to check the stationarity of variables in data (mean, variance & co-variance are constant over time) to avoid spurious or biased estimation. The tests consist of t-statistics that assume a homogeneous unit root process (Levin & Chu, 2002), as well as LLC, ADF-Fisher and PP-Fisher Chi-square statistics that assume a heterogeneous unit root process (Maddala & Wu, 1999; Choi, 2001).

Panel Co-Integration Tests

Panel co-integration tests are used to determine the long-term relationship between variables in the model. Common panel co-integration tests including Pedroni, Kao and Fisher (Pedroni, 2004; Kao, 1999; Fisher, 1992) tests are used to determine the co-integration among all the variables in the model. In this study, we have used all three tests Pedroni, Kao and Fisher.

Panel ARDL/PMG

In this study, a technique called the Panel Autoregressive Distributed Lags (ARDL) pooled Mean Group (PMG) model is used to examine the short-term and long-term connections between the variables. The specific panel ARDL model used is proposed by (Pesaran & Smith, 1995; Pesaran & Smith, 1997). The researchers chose to use a specific method within this model called the ARDL PMG estimator as it is more accurate and efficient. The results of the analysis focus on the significance of the long-term relationships, the influence of group-specific error adjustments, and the short-term relationships.

The specific notations (p,q,q,...q) refer to the number of lags used in the model for different variables. This model is typically used in Econometrics, Development economics, and Finance to study the dynamic relationships between variables over time.

$$\boldsymbol{Y_{it}} = \sum_{z=1}^{p} \Omega_{ij} \boldsymbol{Y_{i,t-z}} \sum_{z=0}^{q} £_{ij} \boldsymbol{X_{i,t-z}} + \boldsymbol{U_i} \; + \; \boldsymbol{e_{it}} \quad \textbf{(4)}$$

The above equation (4) is used to study a relationship between a dependent variable (y_{it}) and a set of explanatory variables ($X_{i,t-z}$) in a panel data set. The model includes a vector of coefficients ($£_{ij}$) for each group, where the groups are identified by the subscript "i" (i = 1, 2... N) And time periods by the subscript "t" (t = 1, 2, ..., T). Additionally, the model includes fixed effects (μ_i) for each group. The dependent variable, y_{it}, is specific to each group and time period. The explanatory variable, $X_{i,t-z}$, is a vector of k variables that are used to explain the dependent variable.

The panel-ARDL model has been reconfigured to include a specific structure of the long-term and short-term dynamic relationships between variables in a panel data set. The new specification of the model is given in an equation (5) below. This re-parameterized panel-ARDL model allows to study the dynamics of the relationships in a more precise way.

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$$\boldsymbol{\Delta Y_{it}} = (\boldsymbol{\pi_i Y_{i,t-1}} + \boldsymbol{\psi_i X_{i,t-1}}) \ \sum_{z=1}^{p-1} \Omega_{ij} \boldsymbol{Y_{i,t-z}} \sum_{z=0}^{q-1} £_{ij} \boldsymbol{X_{i,t-z}} + \boldsymbol{U_{i,t}} + €_{it} \quad \textbf{(5)}$$

Equation (5) represents a re-parameterized panel-ARDL model for studying the long-term and short-term dynamic relationships between variables in a panel data set. The equation includes a dependent variable, "ΔY_{it}", which represents the change in the dependent variable from one period to the next. The speed of adjustment, "π_i", is included in the equation, with a value of zero indicating that there is no long-term relationship between the variables. The "π_i" value is expected to be negative and statistically significant, indicating that the variables will converge to a long-term equilibrium in the event of any disturbances. The error correction term, $(\pi_i Y_{i,t-1} + \psi_i X_{i,t-1})$, represents the long-term model, while the short-term model is represented by the equation $\sum_{z=1}^{p-1} \Omega_{ij} Y_{i,t-z} \sum_{z=0}^{q-1} £_{ij} X_{i,t-z} + U_i$.

In this study, a panel-ARDL model is used to investigate the connection between economic SGDs at disaggregated levels and two dimensions of the Sustainable Development Goals (SDGs): social goal (SSDG) and environmental goal (ENSDG), in relation to economic growth. The model is presented in the form of a long-run equation in the ARDL PMG format.

$$\boldsymbol{GDPGRO_{i,t}} = \boldsymbol{\alpha_1} + \sum_{z=1}^{n} \boldsymbol{\alpha_2}\, \boldsymbol{Goal8_{i,t-z}} + \sum_{z=1}^{n} \boldsymbol{\alpha_3}\, \boldsymbol{Goal9_{i,t-z}} + \sum_{z=1}^{n} \boldsymbol{\alpha_4}\, \boldsymbol{Goal10_{i,t-z}} + \sum_{z=1}^{n} \boldsymbol{\alpha_5} \boldsymbol{Goal17_{i,t-z}} + \sum_{z=1}^{n} \boldsymbol{\alpha_6}\, \boldsymbol{SSDG_{i,t-z}} + \sum_{z=1}^{n} \boldsymbol{\alpha_6}\, \boldsymbol{ENSDG_{i,t-z}} + \mu \boldsymbol{i, t} \ldots (\boldsymbol{6})$$

Where, i shows the countries name like, (Pakistan, India, Bhutan, Nepal, Maldives, Bangladesh and Sri-Lanka), t represent the year (2000 to 2020), z is the maximum lag, and µi is an error term.

Equation 6 represents the long-term relationship between the economic SDGs at disaggregated levels and the two dimensions of the SDGs, social goal (SSDG) and environmental goal (ENSDG), with economic growth. The equation is a specific type of model called PMG Autoregressive Distribution Lag (ARDL), which is used to examine long-term relationships between variables. Additionally, we have applied three different co-integration tests, Pedroni, Kao, and Fisher, to determine the long-term relationship between all the variables in the model. The next step in the study is to examine the short-term relationship using the short-run ARDL model.

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$$\Delta GDPGRO_{i,t} = \alpha_1 + \sum_{z=1}^{n} \alpha_2 \Delta(Goal8)_{i,t-z} + \sum_{z=1}^{n} \alpha_3 \Delta(Goal9)_{i,t-z} + \sum_{z=1}^{n} \alpha_4 \Delta(Goal10)_{i,t-z} + \sum_{z=1}^{n} \alpha_5 \Delta(Goal17)_{i,t-z} + \sum_{z=1}^{n} \alpha_6 \Delta(SSDG)_{i,t-z} + \sum_{z=1}^{n} \alpha_6 \Delta(ENSDG)_{i,t-z} + \mu it + ¥(ECM)_{i,t-z} \quad (7)$$

Equation (7) describes the parameters of the short-term relationship in the model, which includes the Error Correction term (ECM). The ARDL PMG technique is used to analyze both short-term and long-term time periods. The ECM is calculated by taking the difference between the value predicted by the model and the actual value. Additionally, in the short-term, the adjustment value of the error correction term moves towards consistency and stability in the long-term. If the coefficient of ECM is negative and statistically significant, which indicates that there is an association between all the variables in the long-term and short-term in the regression model. Here $(ECM)_{i,t-z}$ represents the lagged value of the ECM term, while the parameter (¥) of ECM indicate the convergence speed to equilibrium.

4. EMPIRICAL RESULT

Table: 1 Descriptive Statistic

	GDPGRO	SDG8	SDG9	SDG10	SDG17	SSDG	ENSDG
Mean	4.979	52.605	43.886	52.489	49.504	49.284	48.661
Median	5.755	52.937	43.226	51.105	49.822	51.432	49.968
Maximum	26.111	93.609	92.967	86.253	74.424	75.451	70.493
Minimum	-33.500	8.943	7.411	13.644	20.726	18.738	22.042
Std. Dev.	5.190	17.223	18.626	18.099	10.531	14.580	10.189
Skewness	-2.867	-0.094	0.210	-0.005	-0.272	-0.245	-0.173
Kurtosis	25.248	2.316	2.737	2.073	3.097	2.070	2.103
Jarque-Bera	3233.256	3.082	1.500	5.262	1.876	2.773	5.656
Probability	0.000	0.214	0.472	0.072	0.391	0.393	0.059
Sum	731.893	7732.903	6451.197	7715.819	7277.084	7244.770	7153.206
Sum Sq. Dev.	3931.946	43307.610	50649.180	47824.720	16192.040	31035.920	15156.620

Table 1 presents the result of descriptive statistics of economic growth (GDPGRO), Economic goals at disaggregated levels with two dimensions Environmental Goals (ENSDG), and Social Goals (SSDG). The average value of GDPGRO, SDG 8, SDG 9, SDG 10, SDG 17, SSDG, and ENSDG are 4.979, 52.605, 43.886, 52.489, 49.504, 49.284, and 48.661 respectively. While the median values of economic growth and all other economic goals at disaggregated levels with two SGD dimensions are 5.755, 52.937, 43.226, 51.105, 49.822, 51.432, and 49.968 respectively. The mean and median values are approximately the same, therefore it is safe to assume that the data is normally

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distributed. The minimum and maximum values of GDPGRO, and economic goals at disaggregated levels with two dimensions ENSDG, and SSDG are also shown in the above table.

A set of values' variance or dispersion is measured by the standard deviation. The standard deviation numbers in the above table indicate that the variation from the sample mean is not significant. Since all of the variable values are close to zero, which is a strong indicator that there is no problem in the data set, there is no typical problem in the data set of the information.

The skewness measures how asymmetric the data is. The generally accepted definition of skewness states that when the value of skewness is near to zero, data are distributed regularly. All the variables in our results, which are shown in the table, have values that are very close to zero, which suggests that the data are distributed regularly. While the value of skewness is employed to determine whether an observed distribution contains outliers. When the kurtosis value is close to or equal to zero, the term "mesokurtic" is employed. As a result, the data set displays a normal distribution. Since all of the variables' kurtosis values are positive and close to zero, our data set is mesokurtic.

The Jarque-Bera test is used to assess whether or not sample data have skewness and kurtosis that are consistent with a normal distribution. For all variables in our data set except GDPGRO, the probability values of the JB test in our situation are statically insignificant at the 5% level of significance. The Jarque-Bera test's non-significant probability values indicate that we accept the null hypothesis that the data have a normal distribution.

Table: 2 Matrix Correlation

	GDPGRO	**SDG8**	**SDG9**	**SDG10**	**SDG17**	**SSDG**	**ENSDG**
GDPGRO	1.000	0.196	-0.099	-0.016	0.163	-0.095	-0.200
SDG8	0.196	1.000	0.301	-0.222	0.441	0.448	0.436
SDG9	-0.099	0.301	1.000	-0.157	0.219	0.348	0.366
SDG10	-0.016	-0.222	-0.157	1.000	-0.486	-0.470	-0.477
SDG17	0.163	0.441	0.219	-0.486	1.000	0.492	0.370
SSDG	-0.095	0.448	0.348	-0.470	0.492	1.000	0.662
ENSDG	-0.200	0.436	0.366	-0.477	0.370	0.662	1.000

Table 2 provided the matrix correlation between different variables. Correlation is a statistical measure that describes the relationship between two variables. In this table, each cell represents the correlation coefficient between two variables. A correlation coefficient of 1 indicates a perfect positive correlation, a coefficient of -1 indicates a perfect negative correlation, and a coefficient of 0 indicates no correlation. The correlation between GDPGRO, SDG 8 (Decent Work and Economic Growth) and SDG 17 (Partnership for the global goals) are 0.196 and 0.163 indicating a positive but weak relationship. This suggests that economic growth, SDG8 and SDG 17 have no serious correlation among each other in the model. The correlation between GDPGRO, SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduce Inequality), Social Sustainable Development Goal (SSDG) and Environmental Sustainable Development Goal (ENSDG) are -0.099, -0.016, -0.095 and -0.200 indicating a negative and weak

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relationship. This suggests that economic growth, SDG 9, SDG 10, SSDG, and ENSDG may not be closely related. The correlation coefficient among SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 17 (Partnership for the global goals), Sustainable Development Goal (SSDG), and Environmental Sustainable Development Goal (ENSDG) are 0.301, 0.441, 0.448 and 0.436, indicating a positive but weak relationship except SDG 10 (Reduce Inequality), which show negative relationship with SDG 8. This suggests absence of multicollinearity in the model. The correlation between SDG 9 (Industry, Innovation, and Infrastructure) and SDG 10 (Reduce Inequality) is -0.157, indicating a negative and weak relationship but SDG 17 (Partnership for the global goals), Social Sustainable Development Goal (SSDG), and Environmental Sustainable Development Goal (ENSDG) are 0.219, 0.348 and 0.366 respectively, indicating a positive relationship with SDG 9. This suggests that the model is free from strong correlation among all the variables. The correlation between SDG 10 (Reduce Inequality) and SDG 17 (Partnership for the global goals), (SSDG), (ENSDG) are -0.486, -0.470 and -0.477, indicating a moderate negative relationship. This suggests that progress in reducing inequality may not be closely related to progress in peace and stability. The correlation coefficient between SDG 17 (Partnership for the global goals), Social Sustainable Development Goal (SSDG), and Environmental Sustainable Development Goal (ENSDG) are 0.492 and 0.370, indicating a moderate positive relationship. The correlation coefficient between SSDG and ENSDG is 0.662, indicating a positive and moderate relationship. This suggests absence of multicollinearity in the model.

Table: 3 Cross-Section Dependence Test

Test	Statistic	Prob.
Breusch-Pagan LM	2.093234	0.56326
Pesaran scaled LM	4.803735	0.34249
Pesaran CD	1.754458	0.66039

*’ **’ *** Shows the significant level at 10%, 5% and 1% respectively

Table 3 provides the result of the cross-sectional dependence test. This statistical test is used to determine the presence of interdependence among individual observations in a cross-sectional data set. If the test result shows an insignificant relationship, it means that there is no evidence of cross-sectional dependence in the model. In other words, the test result suggests that the individual observations are not related to each other and therefore. In such cases, the first-generation unit root test are applied to each variable in the model. However, in this study, we have applied both unit root, first-generation unit root (Levin, Lin, Chu), and second-generation unit root (ADF and PP) tests to compare the results.

The unit root tests for panel data have been suggested in this study. These tests, which incorporate the p-values and calculated statistics from the unit root tests, in this table, used three well-known unit root tests like Levin, lin, chu (LLC), Augmented Dickey fuller (ADF), and Phillips-Perron (PP). To identify the stationary in data of all Economics goals at disaggregated levels with social goals, environmental goals, and economic growth. The

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basic mood of these three tests is to highlight whether variables are stationary at level and first difference in the economics goals (Goal 8, Goal 9, Goal 10, and Goal 17), social dimension, environmental dimension and economic growth model. In table 1 showed the results of the (LLC), (ADF), and (PP) tests.

Table: 4 Unit Root Test

Panel Unit Root								Decision
		At Level			At 1st Difference			
		None	C	C&T	None	C	C&T	
LGDPG	Levin, Lin, Chu	-2.0881 (0.0184)**						
	ADF	-2.50106 (0.0062)***						**I(0)**
	PP	-2.9332 (0.0017)***						
Goal 8	Levin, Lin, Chu	-0.02434 (0.4903)	-1.2107 (0.113)	0.38632 (0.6504)	-9.86896 (0.0000)***			
	ADF	1.04473 (0.8519)	-1.7064 (0.044)	-0.88019 (0.1894)	-8.14914 (0.0000)***			
	PP	1.22333 (0.8894)	-2.2672 (0.0117)	-1.87719 (0.0302)**	-10.2411 (0.0000)***			**I(1)**
Goal 9	Levin, Lin, Chu	1.16579 (0.8781)	0.6038 (0.727)	-1.681 (0.0464)**	-8.81833 (0.0000)***			
	ADF	1.90248 (0.9714)	1.58893 (0.944)	-0.63678 (0.2621)	-7.4393 (0.000)***			**I(1)**
	PP	2.86089 (0.9979)	0.99292 (0.8396)	-0.85889 (0.1952)	-9.90096 (0.0000)***			
Goal 10	Levin, Lin, Chu	-2.99153 (0.0014)***						
	ADF	-1.78231 (0.0373)**						
	PP	-2.01755 (0.0218)**						**I(0)**
Goal 17	Levin, Lin, Chu	0.89952 (0.8158)	-2.7292 (0.0032)***					
	ADF	1.94494 (0.9741)	-2.825 (0.0024)***					
	PP	1.61254 (0.9466)	-2.8597 (0.0021)***					**I(0)**
ENSDGs	Levin, Lin, Chu	3.25274 (0.9994)	-0.3424 (0.366)	-0.6258 (0.2657)	-10.2026 (0.0000)***			
	ADF	3.99598 (1.0000)	1.32677 (0.9077)	-0.81191 (0.2084)	-8.46987 (0.0000)***			
	PP	4.7222 (1.0000)	0.25702 (0.6014)	-3.3040 (0.0006)***				**I(1)**
SSDGs	Levin, Lin, Chu	2.21836 (0.9867)	-1.5417 (0.0616)	1.18212 (0.8814)	-11.0127 (0.0000)***			
	ADF	3.03122 (0.9988)	0.28007 (0.6103)	0.4217 (0.6634)	-8.55095 (0.0000)***			
	PP	4.55791 (1.0000)	0.41355 (0.6604)	1.27515 (0.8989)	-9.32803 (0.0000)***			**I(1)**

In parenthesis ( ) shows the prob-value. *' **' *** Shows the significant level at 10%, 5% and 1% respectively.

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Table 4 shows the results of the unit root test. The outcome of the three-unit root (LLC, ADF, and PP) tests are presented, to illustrate level of stationarity in the given model. This study used panel data for getting the objective, the unit root test has been shown to evaluate the data's stationarity and demonstrate if variables are integrated of order I(0), I(1), or a combination of both. Three well-known techniques, Levin, Lin, Chu, Augmented Dickey-Fuller and Phillip-Perron, are applied. All these three techniques of unit root recognized that some variable are stationary at level, while remaining variable included in the model are stationary at initial level. In this model the economic growth (GDPGRO), Reduce inequality (Goal 10), and Partnership for the global goals (Goal 17) are stationary at level, while other remaining variable or SDGs goals and dimensions i.e. No poverty (Goal 8), Zero hunger (goal 9), environmental sustainable development goals (ENSDGs), and social sustainable development goals (SSDGs) are stationary at first difference. So this situation depict that all SDGs goals and dimension of the model are stationary mixture of both I(0) and I(1). Therefore we used the Panel Autoregressive Distribution lag (PARDL) model for analyzing the impact of economic goals at a disaggregated level with two dimensions of sustainable development goals on economic growth in selected SAARC countries.

Based on these findings, the well-known PARDL co-integration approach is the most appropriate co-integration test for our data out of those that are currently accessible. Table 3 displays the results of the long run PARDL, which is used to determine whether or not the variables and economic SDGs goal with two dimensions are co-integrated over the long run. Co-integration occurs over a long period of time among the variables that are I(1) it means that variable and are non-stationary when the model error is I(0), which depict that economic growth and economic goals at a disaggregated level (Goal 8 “No poverty”, Goal 9 “Zero hunger”, Goal 10 “Reduce inequality” and Goal 17 “Partnership for the global goals”) with two dimensions (environmental and social goal) are stationary at levels and they are co-integrated in the long run. We have used economic goals at disaggregated levels to the three well-known Panel co-integration (Pedroni, Kao, and Fisher Johanson) methods.

Table: 5 VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-2117.625	NA	1.13e+12*	47.61814*	48.97014*	48.16359*
2	-2087.518	50.95076	1.74E+12	48.03336	50.73736	49.12426
3	-2056.141	48.27162	2.67E+12	48.42069	52.47669	50.05704
4	-2013.12	59.56759	3.32E+12	48.5521	53.9601	50.73389
5	-1982.241	38.00477	5.73E+12	48.95036	55.71037	51.6776
6	-1948.245	36.61135	1.01E+13	49.28012	57.39212	52.5528
7	-1892.634	51.33359	1.25E+13	49.13481	58.59882	52.95295
8	-1835.185	44.19106	1.79E+13	48.94913	59.76514	53.31272

Table 5 shows the results of different lag order selection criteria for a VAR model. The different criteria used are: LogL: Log-likelihood of the model, LR: Likelihood ratio test statistic, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz

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criterion, and HQ: Hannan-Quinn criterion. The optimal lag order is typically chosen as the one that minimizes one or more of these criteria. The optimal lag order can be different for each criterion. The asterisks (*) in the FPE, AIC, SC and HQ columns indicate the minimum value for each criterion. Based on the information provided in this table, it appears that the optimal lag order for this model is 1.

Table: 6 Pedroni (Engle-Grange Based) Co-integration test

Alternative hypothesis: common AR coefs. (within-dimension)				
	Statistic	**Prob.**	**Weighted Statistic**	**Prob.**
Panel v-Statistic	5.002824	0.0000***	3.053346	0.0011***
Panel rho-Statistic	3.046922	0.9988	1.513193	0.9349
Panel PP-Statistic	2.164345	0.9848	-3.07023	0.0011***
Panel ADF-Statistic	-2.062586	0.0196**	-2.166272	0.0151**
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic		**Prob.**	
Group rho-Statistic	2.928217		0.9983	
Group PP-Statistic	-1.345672		0.0892*	
Group ADF-Statistic	-1.81194		0.035**	

*' **' *** Shows the significant level at 10%, 5% and 1% respectively.

The co-integration test in table 6 is used to determine whether there is a long-term relationship between variables in a panel data set. The table shows the results of different test statistics: Panel v-Statistic: This test statistic suggests that there is evidence of co-integration with a p-value of 0.0000, meaning that there is existence of co-integration in the model. Weighted Statistic: This test statistic also suggests evidence of co-integration with a p-value of 0.0011. Panel rho-statistic: This test statistic suggests that there is no evidence of co-integration with a p-value of 0.9988, meaning that there is a high probability. Panel PP-Statistic: This test statistic also suggests evidence of co-integration with a p-value of 0.0011 Panel ADF-Statistic: This test statistic suggests that there is evidence of co-integration with a p-value of 0.0196. Group rho-Statistic: This test statistic suggests that there is no evidence of co-integration with a p-value of 0.9983, meaning that there is a high probability that the result does not show the co-integration. Group PP-Statistic: This test statistic suggests that there is evidence of co-integration at 10% significance level with a p-value of 0.0892, which is less than the typical threshold of 0.10, indicating that this test again show the long run relationship among all the variable in the model. Group ADF-Statistic: This test statistic suggests that there is evidence of co-integration with a p-value of 0.035, which is less than the typical threshold of 0.05, indicating that there is a low probability, which is an indication of long run association among all the variable. Based on the results of these test statistics, it can be inferred that there is strong evidence of co-integration among the variables. Most of the test statistics suggest evidence of co-integration while only few tests suggest the opposite. Therefore, we can conclude that there is strong co-integration among all the variables in the model.

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Table: 7 Kao Engle-Granger Based Test

	t-Statistic	Prob.
ADF	-4.97348	0.0000***
Residual variance	30.77649	
HAC variance	19.09146	

*' **' *** Shows the significant level at 10%, 5% and 1% respectively.

Table 7 shows the outcome of the Kao test. The Kao co-integration test is a statistical test used to determine if two or more panel series are co-integrated. The t-Statistic and Prob columns in the table refer to the test statistic and the probability that the null hypothesis (that the panel series of all variables are not co-integrated) is true, respectively. In this case, the t-statistic value of -4.97348 and a probability of 0.0000 suggest that the null hypothesis can be rejected, indicating that all the variables are co-integrated.

Table: 8 Fisher (Combine Johansen) Trace and Max-Eigen value Co-integration Test

Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	9.704	0.7835	9.704	0.7835
At most 1	6.931	0.9373	43.77	0.0001***
At most 2	128.9	0.0000***	128.9	0.0000***
At most 3	200.5	0.0000***	133.3	0.0000***
At most 4	95.28	0.0000***	78.67	0.0000***
At most 5	33.64	0.0023***	26.72	0.0209**
At most 6	26.83	0.0203**	26.83	0.0203**

*' **' *** Shows the significant level at 10%, 5% and 1% respectively.

Table 8 presents the result of the fisher Johansen co-integration test. The results, including the hypothesized number of co-integrating vectors and the Fisher statistic and probability values for both the trace test and the max-Eigen test. The trace test and max-Eigen test are two different methods for estimating the number of co-integrating equations. The trace test is based on the trace of the matrix of eigenvalues, while the max-Eigen test is based on the maximum eigenvalue. In this table, the "Hypothesized" column represents the number of co-integrating equations that are being tested for, the "Fisher Stat." column shows the value of the Fisher statistic for each test, and the "Prob." column shows the corresponding probability value. The probability values are used to determine the significance of the test results, with a low probability indicating strong evidence for co-integration. The test results suggest that at most 1 to at most 6 co-integrating vectors are present in the system, with a probability of 0.0000 for both trace test and max-Eigen test. There is a strong evidence for the presence of at least six co-integrating equations shown in the system.

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Table: 9 Long Run and Short Run Relationship between Economic SDGs and Economic Growth Model

Long Run Result of ARDL				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
SDG8	0.100486	0.012703	7.910213	0.0000***
SDG9	-0.03625	0.009361	-3.872304	0.0002***
SDG10	-0.025073	0.007498	-3.343907	0.0012***
SDG17	0.047144	0.016036	2.939947	0.0042***
SSDG	-0.10376	0.017382	-5.969316	0.0000***
ENSDG	-0.032712	0.014538	-2.247660	0.0061***
Short Run Result of ARDL				
D(SDG8)	0.044278	0.037504	1.180638	0.241
D(SDG9)	-0.015063	0.069627	-0.216336	0.8292
D(SDG10)	-0.012459	0.028666	-0.434629	0.6649
D(SDG17)	0.043476	0.039955	1.088128	0.2796
D(SSDG)	0.154297	0.072619	2.124765	0.0365**
D(ENSDG)	0.030977	0.048786	0.634961	0.5272
C	5.976273	1.589183	3.760594	0.0003
ECM_{t-1}	-0.872719	0.176401	-4.947356	0.0000***

*' **' *** Shows the significant level at 10%, 5% and 1% respectively.

Table 9 indicates the result of ARDL PMG for the economic growth model. The coefficients of the variables, in the long run, ARDL PMG model indicate the relationship between each Economic Goal at disaggregated levels with two dimensions Environmental Goals (ENSDG) and Social Goals (SSDG) and economic growth (GDPGRO). A positive coefficient indicates a positive relationship, meaning that as the economic goal increases, economic growth also increases. A negative coefficient indicates a negative relationship, meaning that as the economic goals increases, economic growth decreases. The t-statistic and prob.* columns provide information on the statistical significance of each coefficient. A low probability value (e.g. $p<0.05$) suggests that the coefficient is statistically significant.

The coefficient of 0.100486 for SDG8 (Decent work and economic growth) in the long-run result of ARDL suggests that there is a positive relationship between SDG8 (Decent work and economic growth) and economic growth (GDPGRO). This means that as SDG8 increases, economic growth also increases. The t-Statistic of 7.910213 and the probability value of 0.0000 indicate that this relationship is statistically significant. This significant relationship between SDG 8 and economic growth depicts that when SDG 8 increases by one unit then the economic growth increases by 10% in selected SAARC countries in the long run. SDG 8 aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. A positive relationship between this goal and economic growth can be seen in sustainable economic growth, which can lead to an increase in job opportunities and wages, which can in turn lead to improved living standards and reduced poverty. Additionally, inclusive economic growth, which focuses on ensuring that all members of society have equal opportunities to participate in

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and benefit from economic growth, can help to reduce income inequality and promote social inclusion. By promoting sustained, inclusive, and sustainable economic growth, SDG 8 can contribute to overall economic development and improve the well-being of individuals and communities.

The results from the long run of the economic growth Model indicate that there is a significant negative relationship between SDG9 (Industry, innovation, and infrastructure) and economic growth (GDPGRO). Specifically, as SDG9 increases, economic growth decreases. This relationship is statistically significant at a 1% level, suggesting that a higher level of SDG9 (Industry, innovation, and infrastructure) leads to a decrease the economic growth by-0.03625% in the SAARC countries except Afghanistan. These results is consistent with the priory expectation of (ADB, 2017). SDG 9 aims to "build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation." While it is generally considered a positive goal, there can be a negative relationship between SDG 9 and economic growth under certain circumstances. It could lead to overcapacity and wasted resources. This can negatively impact economic growth by reducing productivity and efficiency, as well as creating financial losses for the government and private sector. Additionally, if the government is not careful in its implementation of the infrastructure projects, it could lead to corruption, lack of transparency and accountability, which can also have a negative impact on the economy. Furthermore, the process of industrialization and infrastructure development can lead to negative social and environmental impacts, such as displacement of communities, pollution, and loss of biodiversity, which can lead to lower GDP, decline in tourism and other economic sectors.

The SDG10 (Reduce inequality) has a negative coefficient of -0.025073 and a probability value of 0.0012, indicating a statistically significant negative relationship between SDG10 (Reduce inequality) and economic growth. This means that as SDG10 increases, economic growth decreases by -0.025073 percent in the long run for selected SAARC countries. This finding consistent with the analysis of following report (International Monetary Fund, 2015). SDG 10 aims to "reduce inequality within and among countries." While reducing inequality is generally considered a positive goal, there can be a negative relationship between SDG 10 and economic growth under certain circumstances. One potential negative relationship is that redistributive policies, such as progressive taxation and social welfare programs, can reduce incentives for individuals to work and invest, which could lead to lower economic growth. Additionally, if redistributive policies are not implemented in a targeted and efficient manner, they may not effectively reduce inequality and can lead to a reduction in overall economic growth. Another potential negative relationship is that reducing inequality could lead to a decrease in the income and consumption of high-income earners, which could reduce their incentives to invest and innovate, which in turn could reduce economic growth. Additionally, some experts argue that too much focus on reducing inequality can lead to policies that stifle economic growth, such as heavy regulation and taxes on business, which could deter investment, reduce job opportunities and slow down the economy. It's important to note that the relationship between reducing inequality and economic growth is complex, and it can vary depending on the specific circumstances and policies involved.

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SDG17 (Partnership for the global goals) has a positive coefficient of 0.047144 and a probability value of 0.0042, indicate a statistically significant positive relationship between SDG17 (Peace, justice, and strong institutions) and economic growth. This means that as SDG17 increases by one unit, economic growth increases by 0.047144 percent during one year in selected SAARC countries. SDG 17, or the Sustainable Development Goal 17, aims to strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development. In way this can be achieved is through partnerships between governments, the private sector, and civil society to drive economic growth in a sustainable way. For example, private sector investment in sustainable infrastructure and technology can lead to job creation and economic growth, while also contributing to the achievement of other SDGs such as reducing poverty and combatting climate change. Additionally, partnerships between governments and civil society can lead to more effective implementation of policies that promote sustainable economic growth, such as education and training programs for workers in high-growth industries. Overall, SDG 17 can help to create an enabling environment for economic growth that is sustainable and inclusive, which can have positive impacts on people and the planet.

The SSDG (Social Goals) has a negative coefficient of -0.10376 and a probability value of 0.0000, suggest statistically significant negative relationship between SSDG (Social Goals) and economic growth. This relationship means that if one unit increase in SSDG, then the economic growth would be decreased by -0.10376 percent during one year. There can be a negative relationship between social goals and economic growth. This can occur in several ways: increased spending on social programs, such as healthcare and education, can lead to higher government spending and higher taxes, which can reduce economic growth. Tackling social issues, such as poverty and inequality, may require redistributive policies that can lead to reduced incentives for investment and productivity. Regulations and policies aimed at achieving social goals, such as protecting the environment or improving working conditions, can increase costs for businesses, which can lead to reduced competitiveness and slower economic growth. Achieving certain social goals, such as reducing inequality, may require sacrifices in short-term economic growth in order to achieve long-term social benefits. It's worth noting that this negative relationship is not always the case and in many instances, social goals and economic growth can be mutually reinforcing. For example, investing in education and healthcare can lead to a more productive and healthier workforce, which can drive economic growth. Furthermore, addressing social issues such as poverty and inequality can lead to a more stable and inclusive society, which can create a more conducive environment for economic growth.

The ENSDG (Environmental Goals) has a negative coefficient of -0.032712 and a probability value of 0.0061, indicating a statistically significant negative relationship between ENSDG (Environmental Goals) and economic growth. This relationship depicts that if ENSDG increases by one unit, then economic growth decreases by -0.032712 percent during one year. Environmental sustainable development goals (ENSDGs) aim to protect and preserve the environment, while promoting sustainable development. However, there can be a negative relationship between ENSDGs and economic growth under certain circumstances. One potential negative relationship is that policies aimed at

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protecting the environment, such as regulations on pollution and conservation, can increase the costs of production for businesses, which can lead to higher prices for consumers and reduced economic growth. Additionally, if these policies are not implemented in a targeted and efficient manner, they may not effectively protect the environment and could lead to a reduction in overall economic growth. Another potential negative relationship is that investing in sustainable development, such as renewable energy, can be more expensive than traditional fossil fuels, and this can increase the cost of production and reduce the competitiveness of some sectors, leading to lower economic growth. Additionally, some experts argue that too much focus on environmental sustainability could lead to policies that stifle economic growth, such as heavy regulation and taxes on business, which could deter investment, reduce job opportunities and slow down the economy. Moreover, some industries that are heavily dependent on fossil fuels or other non-renewable resources may face challenges in transitioning to a more sustainable economy and this could lead to job losses and economic downturns in the short-term. It's important to note that the relationship between environmental sustainable development and economic growth is complex, and it can vary depending on the specific circumstances and policies involved. However, by implementing policies that are efficient, targeted, and inclusive, taking into account the costs and benefits for both the economy and the environment, it's possible to find a balance between protecting the environment and promoting economic growth.

The second part of table shows the short-run results of economic growth model. The probability column indicates the level of significance of the t-statistics. A probability value less than 0.05 ($p < 0.05$) indicates a statistically significant relationship between the economic goals at disaggregated levels and economic growth. Here, the variable D(SSDG) has a probability value of 0.0365 which is less than 0.05 indicating it is statistic significant. This means that changes in the variable D(SSDG) are positively related to changes in the dependent variable in the short-run. While the variables D(SDG8), D(SDG9), D(SDG10), D(SDG17) and D(ENSDG) are not significantly related to changes in the economic growth in the short-run.

The ECM term in this table is an error correction term, which is used to capture the short-run dynamics of a panel relationship. In this table, the coefficient of the ECM_{t-1} term is -0.872719, with a t-statistic of -4.947356, and a probability value of 0.0000. The negative coefficient value indicates that the ECM_{t-1} term is negatively and statistically significant. This means that the variable is expected to converge to equilibrium, this situation confirms that there is strong evidence that the model will be adjusted at the speed of 87% in the long run.

5. CONCLUSION AND POLICY RECOMMENDATION

The SDGs represent a new direction for the global community, integrating social, economic and environmental sustainability into all policies and strategies to eliminate poverty and inequality to achieve a more prosperous society. The paper adopted a Panel ARDL PMG approach using economic goals at disaggregated levels with economic growth. This study examines the relationship between Economic Goals at disaggregated

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level, Environmental and Social Goals (ENSDG and SSDG) with economic growth (GDPGRO) for selected 7 SAARC countries except Afghanistan. The results obtained at aggregate level. The result indicates a positive and statistically significant relationship between SDG8 (Decent work and economic growth) and economic growth (GDPGRO). This relationship can be seen in sustainable economic growth leading to job opportunities, wages and reduced poverty and inclusive growth reducing income inequality and promoting social inclusion. The model shows that there is a statistically significant negative relationship between SDG9 (Industry, innovation, and infrastructure) and economic growth (GDPGRO). It could lead to overcapacity which negatively impacts economic growth. The results of the PARDL model indicate a statistically significant negative relationship between SDG10 (Reduce inequality) and economic growth in selected SAARC countries. The relationship between reducing inequality and economic growth is complex and can vary depending on specific circumstances of region. SDG17 (Partnership for global goals) has a positive relationship with economic growth. SDG 17 aims to strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development through partnerships between governments, private sector, and civil society to drive economic growth in a sustainable way. The SSDG (Social Goals) has a negative correlation with economic growth, which means that increased spending on social programs and regulations can lead to reduced economic growth. The ENSDG (Environmental Goals) also has a negative correlation with economic growth, as environmental policies can increase costs for businesses and make certain sectors less competitive. Based on the Economic goals model discussed, there are several policies that can be implemented to promote Economic goals at disaggregated levels with Environmental and Social Goals and achieve sustainable economic growth in SAARC countries.

To promote decent work and economic growth, policies should focus on job creation and skill development, as well as increasing wages and reducing poverty. This can be achieved through targeted investments in sectors that are likely to create jobs, and by implementing policies that increase the bargaining power of workers. Further, to promote sustainable industrialization and infrastructure development, policies should focus on supporting innovation and investing in industries that are in line with market demand and are economically viable. This can be achieved through targeted investments in research and development, as well as by implementing policies that encourage private sector investment in sustainable industries. To reduce inequality and promote social inclusion, policies should focus on redistributive measures, such as progressive taxation and social welfare programs. This can be achieved through targeted investments in education and healthcare, as well as by implementing policies that promote gender equality and protect the rights of marginalized groups. The Government can promote partnerships for global goals, and policies should also focus on strengthening the means of implementation and revitalizing the Global Partnership for Sustainable Development. This can be achieved by creating partnerships between governments, private sector, and civil society to drive economic growth in a sustainable way. To promote sustainable economic growth, policies should focus on promoting social and environmental goals efficiently and targeted. This can be achieved through targeted investments in social programs and regulations that have positive effects on economic growth, as well as by implementing policies that encourage businesses to adopt sustainable practices.

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