

Poverty Reduction Programmes and Household Well-being in South Asia: The Role of Social Protection, Economic Security and Human Capital

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Abstract: This research analyzes the impact of poverty alleviation initiatives on households' well-being in seven countries of South Asia between 2010 and 2025. The study adopts a broader understanding of poverty than is usually provided by monetary measures, and examines the pathways by which poverty reduction policies and programs will lead to welfare. The study utilizes a balanced panel of data and fixed-effects estimation, System Generalised Method of Moments (GMM) and Cross-Sectional Autoregressive Distributed Lag (CS-ARDL) methodologies to account for country specific heterogeneity, dynamic relations, endogeneity, cross sectional dependence and long-run equilibrium effects. The results show that the intensity of poverty reduction programmes is positively and statistically significant for household well-being in both the long and short terms, and that the long-term impact is greater than the short-term impact. The mediation analysis also suggests that economic security, human capital and financial inclusion are key mechanisms by which poverty reduction programmes are associated with household well-being. In addition, governance quality positively moderates this relationship, suggesting that the capacity of the institutions positively influences the welfare returns from poverty reduction interventions. Robustness and heterogeneity analyses show that the main results are robust to other specifications and country groupings. The study suggests that effective poverty alleviation needs to be seen as more than just adding to programme spending, as continuous interventions are needed to bolster household economic security, human capabilities and financial inclusion, all of which are underpinned by effective governance, in order to ensure that poverty alleviation efforts will lead to lasting improvements in household well-being. Results have key policy implications on how to create poverty reduction strategies that are integrated and institutionally responsive in South Asia.

Keywords: Poverty reduction programmes; Household well-being; Economic security; Human capital; Financial inclusion; Governance quality; South Asia; Social protection

1. Introduction

Despite the significant progress in reducing extreme poverty, enhancing human development and increasing social protection in the last decades, poverty continues to be one of the most longstanding development challenges in South Asia. The region is still home to large numbers of people who are at risk from income shocks, unemployment, inflation, expenses on health, food insecurity and other economic insecurities. Such weaknesses have been increasingly significant after the COVID-19 pandemic, global commodity-price pressures and frequent macroeconomic volatility. Thus poverty reduction has come to focus increasingly less on the direct goal of raising household incomes and more on a general development agenda that is interested in improving household well-being, economic security, human capabilities and resilience. In this context, poverty reduction programmes such as cash transfers, social protection policies, microfinance, employment promotion, targeted

assistance or welfare policies – have emerged as key policy tools to improve the lives of vulnerable households.

The traditional measurement of poverty reduction programme outcomes has concentrated on monetary indicators – household income, consumption expenditure and risk of falling below a poverty line. While useful, these indicators do not adequately reflect household welfare in its multidimensional aspects. Income can increase in a household without it having more economic security, access to education and healthcare, or financial inclusion or a subjective sense of satisfaction with their lives. Thus, household well-being offers a more comprehensive result to measure the effectiveness of poverty reduction interventions. Recent empirical research is now finding growing evidence that poverty reduction policies can have an impact on subjective well-being and other non-monetary aspects of welfare. For instance, Hameed et al. (2024) find that conditional cash transfers are effective in enhancing the welfare of households in Pakistan and Morales Martínez and Gori Maia (2018) find that cash transfers can impact subjective wellbeing, among other outcomes, and poverty. Likewise, Tang et al (2021) conclude that subjective well-being of rural people improves when they participate in poverty alleviation programmes.

This larger context is of special relevance for South Asia. There are significant variations between countries in the region in terms of economic development, social protection systems, institutional quality, financial inclusion and programme coverage. Some countries have built up comprehensive systems of social safety nets, while others are still constrained in programmes' coverage and targeting, the administrative capacity and fiscal resources. Such differences may result in substantial variation in the effectiveness of poverty reduction interventions. The effects of a programme in one institutional context can be more modest than in another due to various aspects of governance, implementation capacity, availability of complementary services and the economic context. A comparative analysis of the association between poverty reduction programmes and household well-being for South Asian countries can therefore be useful to draw some important comparative evidence that cannot be provided by a single country study.

There is a large body of existing research on the welfare implications of individual poverty reduction measures. One of the most widely studied interventions is cash transfer. In the context of Pakistan, Hameed et al. (2024) present quasi-experimental evidence on the effect of unconditional cash transfers on household welfare, emphasizing the need to provide direct support to the income of economically vulnerable households. Morales Martínez and Gori Maia (2018) also demonstrate that greater subjective well-being can be achieved alongside decreases in poverty through cash transfers. A more comprehensive systematic review by Light et al. (2024) finds evidence on the impact of conditional and unconditional cash transfers on poverty, education and health outcomes, implying that transfer programmes can have multi-dimensional impacts. Further Zaneva et al. (2022) in a systematic review and meta-analysis show that monetary poverty alleviation programmes can have implications for the mental health of children and adolescents.

There have been other investigations of poverty alleviation strategies. For instance, microfinance can help finance credit and help finance productive, productive investment to an economically poor household. Samer et al. (2015) presents the role of microfinance in poverty reduction in Malaysia, while Wahab et al. (2018) shows that microfinance is relevant for rural poverty alleviation and social well-being. The results indicate that financial access can be one significant pathway for households to achieve better living conditions through poverty interventions. Likewise, Senadjki and Sulaiman (2015) highlight that there are wider institutional and value-based aspects of poverty alleviation. It is also noted from the literature that poverty reduction programmes can be expected to produce significant human-capital impacts. Household economic changes can lead to increased investment in education, health and children development, which can lead to welfare gains that are longer lasting than the intervention itself. For instance, Li et al. (2025) offer evidence from systematic review and meta-analysis of the impact of poverty reduction programmes on the psychological development of children and adolescents at risk of poverty. In a similar vein, Light

et al. (2024) point to the importance of education and health outcomes in relation to cash-transfer interventions.

However, there are some significant gaps in this expanding literature. First, many of the studies examined are for a single programme, or a single country, so it is hard to draw conclusions on the consistency of the welfare effects across different South Asian economies. Secondly, poverty or income/consumption is often the focus of prior research whereas very little work has been done on household well-being as a more general multidimensional measure. Thirdly, there are still gaps in the integration of the mechanisms by which poverty reduction programmes influence the well-being of households in one empirical framework. Each one of these transmission channels, such as economic security, human capital, and financial inclusion, may be of great significance but are often studied in isolation. Fourth, the role of governance as a condition of the effectiveness of poverty reduction programmes is still relatively under-researched in a cross country south Asian context. The present study fills the gaps by studying the impact of poverty reduction programmes on household well-being in seven South Asian countries between 2010 and 2025. The analysis views the intensity of poverty reduction programmes as the key explanatory variable and household well-being as the key outcome. It also explores possible mediation mechanisms (economic security, human capital and financial inclusion) and a moderating institutional factor (governance quality). This framework enables the study to go beyond merely asking whether poverty reduction programmes are effective and to asking how they are effective, which channels and under what institutional conditions they are effective in improving household well-being.

In methodological terms, it is a fully fledged panel-data analysis tackling several econometric issues regarding analysis across countries. Preliminary diagnostics check on the cross-sectional dependence and integration properties of the variables and panel cointegration tests investigate the existence of long-run relationships. The baseline evidence is offered by fixed-effects estimation, while System GMM takes care of dynamic persistence and possible endogeneity. CS-ARDL estimation is then used to separate the short-run from long-run effects and to consider the cross-sectional dependence. Mediation analysis helps in understanding the roles that economic security, human capital and financial inclusion play, while interaction analysis is used to assess if the governance quality context matters for the poverty reduction programmes and household well-being. Robustness and heterogeneity analyses are also performed to evaluate the consistency of the results for different alternative specifications and country contexts.

The study has several contributions to the literature. First, it offers the comparative evidence on poverty reduction and household well-being across South Asia in a relatively recent timeframe (from 2010 to 2025), which reflects key changes in social protection and economic conditions. Second, it expands the analysis of poverty reduction programmes beyond monetary poverty to the well-being of households. Third, it recognizes that the economic security, human capital and financial inclusion can be welfare-enhancing channels of the programme interventions. Fourth, it illustrates the relevance of governance quality in explaining the effectiveness of poverty reduction programmes. Last, the use of three different estimators – static, dynamic and long-run panel estimation – in combination with mediation, moderation, and robustness and heterogeneity analysis leads to a more complete evaluation of the poverty reduction–well-being relationship.

2. Literature Review

As poverty is now seen as a multifaceted phenomenon, rather than just lack of money, it has gained in attention as the focus of poverty reduction programmes. The traditional focus of conventional poverty reduction policies has been on the generation of income and consumption and on material living standards, while more recent research has begun to recognize the psychological well-being, health, education, social inclusion and subjective life satisfaction as significant aspects of welfare. From this wider lens, poverty reduction programmes may have many ways to affect household welfare, such as:

Increasing economic resources, access to education and health, providing better livelihood opportunities and providing improved financial security. A key theme of the literature is how the efforts to achieve national poverty reduction are related to poverty and well-being outcomes. Elkins et al. (2018) examined the correlation between Poverty Reduction Strategy Papers (PRSPs) and poverty reduction and well-being improvements. They are important in their study because they do not just focus on how individual programmes are evaluated, but rather take into account the policy arena within which poverty reduction strategies are set up to be delivered. The authors' results show that a poverty reduction strategy does not automatically guarantee a positive welfare impact, and point to the role of implementation, institutional setting and policy context. This implies that poverty reduction programmes do not automatically mean that household wellbeing improves and that programme results are determined by how resources are delivered and how these resources are translated into welfare improvements.

Another important mechanism by which poverty reduction policies can impact household welfare is cash transfer programmes. This paper (Hameed et al., 2024) took the case of Pakistan to analyze the impact of unconditional cash transfers on the well-being of households. Their results show the importance of cash based interventions for enhancing the household welfare and offer valuable evidence from a South Asian developing country context. It is important to note that the evidence from Pakistan is relevant for the present study as it shows that welfare can be affected directly through the poverty reduction programmes that have an impact on household economic resources. Unconditional transfers can alleviate liquidity constraints and enhance the material living standards and general perceptions of well-being of households.

Morales Martínez and Gori Maia (2018) also studied the effect of cash transfers on subjective well-being and poverty in Colombia, providing further evidence of the positive welfare implications of cash transfers. What they find suggests cash transfers can have an impact on not only objective poverty but also subjective perceptions of well-being. This distinction is also of theoretical significance, as households can improve in life satisfaction, in feel of security and in overall wellbeing without seeing necessary improvements in conventional monetary poverty measures. Hence, well-being of a household cannot only be understood as income or consumption. The evidence from China further validates the link between interventions for poverty reduction and subjective well-being. Tang et al. (2021) investigated whether the subjective welfare of rural residents in Shanxi would improve after their participation in poverty alleviation programmes and observed that poverty alleviation programmes can improve the subjective welfare. Similarly, Wang and Yang (2026) studied if the targeted poverty alleviation programs can have a positive impact on the subjective well-being of poverty reduction households and offered additional evidence that targeted poverty reduction can bring welfare gains beyond the conventional poverty measures.

This could also be children and adolescents who are in poverty reduction beneficiary household. A systematic review and meta-analysis of low-, middle- and high-income countries conducted by Zaneva et al. (2022) explored the effects of monetary poverty alleviation programmes on children and adolescents' mental health. They found that monetary poverty alleviation can have psychological poverty alleviation implications for youth, and that perhaps by improving the household's monetary situation, one can also alleviate psychological poverty conditions. The evidence contributes to the conceptualisation of household well-being by providing proof that poverty reduction programme benefits can be 'felt' across generations. Likewise, Li et al. (2025) conducted a systematic review and meta-analysis on poverty reduction programmes and children and adolescent psychological development at risk of poverty. Their results also indicate that poverty alleviation interventions may have impacts on the psychological and developmental outcomes of vulnerable young people.

This correlation between poverty alleviation and human capital is also reflected in studies on education and health. Light et al. (2024) conducted a systematic review based

on the PRISMA protocol to investigate conditional and unconditional cash transfers in Sub-Saharan Africa and their impact on poverty alleviation, education and health. Their evidence suggests that both conditional and unconditional transfers can have positive impacts on a range of welfare targets, though impacts can be different in size and nature depending on the design of the programme and the context. This indicates that there are various approaches to poverty reduction programmes. Financial resources can not only directly raise the consumption of the households but also contribute to the investment in the education, health care and other forms of human capital of the children in the households.

Poverty reduction programmes can include cash transfers, but they can also take place through livelihood development and productive interventions. Liao et al. (2021) studied the targeted poverty alleviation with photovoltaic-based intervention in Qinghai, China, which reveals the potential and limitations of livelihood oriented poverty reduction. They have shown that poverty reduction programmes, which are potentially productive, can generate economic opportunities and consequently welfare gains; however, the rhetoric of a programme does not automatically transfer to actual welfare gains. The results confirm the need for the analysis of poverty reduction interventions' effectiveness, and not simply the fact that they are undertaken. In a similar vein, Su et al. (2023) examined if poverty alleviation policies have a positive impact on the welfare of land transfer farmers in rural China.

Microfinance and microcredit are also key strategies of alleviating poverty, especially in developing countries. Samer, et al (2015) studied the effect of microfinance on poverty reduction from a Malaysian point of view and found that access to microfinance can be a factor in reducing poverty. Microfinance can potentially enhance household's well-being by easing credit constraints, which can lead to investments in productive activities and also contribute to income generation. Similarly, Wahab et al. (2018) explored the microcredit for rural poverty alleviation and social well-being in Sabah, Malaysia. Their results indicate that microcredit can have an impact not only on economic variables but on social welfare in general.

Financial and productive empowerment is also seen in the study on Islamic poverty alleviation and community poverty alleviation. Senadjki and Sulaiman (2015) explored how Islamic values affect the alleviation of poverty and the need for value-based mechanisms and social institutions to solve poverty. In addition, Bouanani and Belhadj (2019) conducted a fuzzy analysis on the relation between zakat and poverty alleviation in Tunisia, which showed that faith-based redistributive mechanisms also can play a role in alleviating poverty. Such research is especially pertinent to the South Asian context where formal social-protection programmes operate alongside informal community-based and faith-based system of redistribution.

Overall, the literature reviewed suggests that poverty reduction programmes can impact on the well-being of households in a number of different, yet connected ways. The first pathway is the economic security pathway through increased transfers, microfinance and livelihood interventions, resulting in increased household resources, consumption capacity and financial security. The evidence of this mechanism comes from Pakistan, Colombia and China (Hameed et al., 2024; Morales Martínez & Gori Maia, 2018; Tang et al., 2021). The second is the human capital pathway, where poverty reduction brings benefits for access to education, healthcare, and developmental opportunities, especially for children and adolescents (Light et al., 2024; Li et al., 2025; Zaneva et al., 2022). The third is the psychological pathway, in which improving economic conditions alleviates financial stress and leads to better subjective and psychological well-being (Morales Martínez & Gori Maia, 2018; Tang et al., 2021; Wang & Yang, 2026). The fourth is the livelihood empowerment pathway, where microfinance, productive interventions and targeted rural development programmes boost sustainable earning potential of households (Samer et al., 2015; Wahab et al., 2018; Liao et al., 2021).

However, there are still some gaps in the literature despite the important contributions. First, the evidence available is largely from single-country studies, including China, Malaysia, Pakistan and Colombia. These studies offer valuable evidence on particular programme mechanisms, but this evidence may not be directly transferable to other countries with varying institutional, economic and social-protection contexts. Secondly, much of the literature focuses on the effectiveness of particular types of programmes, including cash transfers, microfinance or targeted poverty alleviation, instead of looking at the overall impact of poverty reduction programmes at the policy level. Thirdly, while a number of studies find impact on subjective well-being, education, health or psychological outcomes, relatively few studies combine these dimensions into a more comprehensive view of a household's well-being.

Another constraint is the geographical evidence base. However, there is no systematic comparative evidence from the existing literature except from Pakistan that can be considered particularly relevant in the context of the current study, namely the study of Hameed et al. (2024). South Asia is thus a significant context to study poverty reduction as a number of countries in the region have implemented a variety of strategies regarding social protection, cash transfers, livelihood programmes, microfinance and human-capital development. Meanwhile, there are significant variations in programme coverage, programme quality, fiscal capacity, and programme effectiveness. A cross-country analysis can thus offer insights which cannot be gained from single country programme evaluations.

Additionally, it is suggested in the literature that the effectiveness of the programme might be determined by institutional and contextual factors. Broad-based poverty reduction policies may not necessarily yield consistent poverty and well-being results – Elkins et al. (2018) – and the intent and actual outcomes of poverty alleviation policies may differ – Liao et al. (2021). These results suggest that poverty reduction programmes should be subject of empirical investigation, not necessarily taken for granted as having a positive impact. In this context, this current study views poverty reduction programmes as a wide-reaching policy intervention with the potential of affecting households' well-being through economic, human-capital and psychological pathways. The study takes a more general view of well-being, rather than just monetary poverty, covering household living standards, economic security and other aspects of welfare. The proposed framework thus addresses the mounting evidence that poverty alleviation can impact not only on conventional dimensions of poverty, but also on subjective wellbeing, psychological development, education, health and social welfare (Zaneva et al., 2022; Li et al., 2025; Light et al., 2024).

The proposed South Asian panel perspective adds to the current literature the analysis of the effect of poverty reduction programmes on household welfare from a comparative perspective and over time. A panel from around 2010 to 2025 can account for changes in the social-protection systems and in poverty reduction policies and household welfare, while controlling for country-specific and common temporal effects. This can be used alongside the quasi-experimental and micro evidence presented in Hameed et al. (2024) to offer a more macro-comparative point of view.

3. Methodology

The present study is of quantitative longitudinal panel data design to investigate the impact of poverty reduction programmes on household well-being in the countries of South Asia in 2010-2025. For this study, poverty reduction programmes (PRPs) are defined as government-led interventions aimed at lowering household economic vulnerability and enhancing living conditions, such as social assistance, cash transfers, social protection, livelihood-support and other poverty alleviation programmes. Well-being in households is regarded as a multidimensional phenomenon, not just a monetary poverty but also a multi-material one, with material standard of living, economic security, health, education and access to basic services. The panel-data design allows the study to take

advantage of the cross-country and temporal variation and to account for unobserved country-specific attributes and shocks common to each year.

The empirical sample includes the South Asian countries for which reasonably comparable data can be obtained for the time period covered. The main sample consists of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka, and Afghanistan is treated as data availability and comparability. The final sample is decided based on the availability of the main poverty reduction and household well-being indicators. If data from annual observations do not exist, the observed data are kept, and not artificial interpolations of the principal explanatory variables are made. An unbalanced panel is thus allowed if it is necessary. This is desirable, as multiple social-protection indicators are based on nationally representative household surveys which are not carried out from year-to-year in all South Asian countries.

The key explanatory variable is intensity of poverty reduction programmes. This building blocks represents both the amount and impact of poverty reduction interventions. The key indicators are: social assistance coverage; social protection expenditures; benefit adequacy; and the poverty reduction impact of social protection interventions. The World Bank's Atlas of Social Protection Indicators of Resilience and Equity (ASPIRE) is the main source for these indicators, as it offers internationally comparable data on social assistance and social insurance and labour-market programmes. ASPIRE features indicators of programme coverage, benefit incidence, adequacy and simulated impacts on poverty and inequality. Alternative measures of programme intensity are then applied to determine if the conclusions are robust when different measures of poverty reduction programmes are applied.

The main dependent variable is household well-being. Since poverty is multidimensional it does not consider that the well-being of households is only determined by their income or consumption. Where adequately comparable indicators are available, a composite household well-being index is created, using principal component analysis. The index incorporates indicators reflecting household living standards and access to essential services, such as consumption or income, electricity, sanitation, drinking water, education and health. The common welfare dimension that is found in these indicators is represented by the first principal component, and the larger scores are associated with increased household well-being. However, a composite index has the advantage of measuring welfare improvements that might not be seen in traditional monetary poverty measures. Robustness tests with alternative indicators such as poverty headcount, poverty gap, consumption-based welfare, and other living standard indicators available are subsequently conducted.

The paper also explores three potential ways poverty reduction programmes can affect household well-being: economic security, human capital and financial inclusion. Economic security is indicated by households' ability to cope with the basic needs and maintain consumption levels while facing economic shocks. Poverty reduction programmes can enhance economic security through the expansion of household resources and lessen financial vulnerability. Human capital reflects improvements in education and health, which could be those resulting from poverty programmes that allow households to invest in their children's schooling, healthcare and nutrition. Financial inclusion reflects access to formal financial and digital financial services with which government transfers can be made and households can enhance their ability to manage financial resources. The mechanisms are analysed individually to see if they can account for part of the relation between poverty reduction programmes and household well-being.

The study starts by doing descriptive statistical analysis to see the characteristic and distribution of all variables. Means, standard deviations, minimum and maximum are computed for each variable and used to provide an overview of the differences in the intensity of poverty reduction programmes and household well-being across countries and over time. Then, a correlation analysis is performed to obtain a preliminary direction and strength of the relationships among the variables. Variance Inflation Factors and other

procedures are used to check for multicollinearity. These preliminary analyses are performed to first gain a general impression of the data and to look for possible statistical issues before attempting main panel analyses.

Due to the economic and geographical linkages of the countries in South Asia, cross sectional dependence is an explicit feature of the analysis. The region can be prone to similar global and regional shocks such as fluctuations in food and energy prices, global economic conditions, climate-related events, financial shocks and the COVID-19 pandemic. To investigate the cross-sectional dependence of the observations across countries, Pesaran's cross-sectional dependence test is used. Such dependence can be especially problematic as standard panel estimators can provide inefficient or biased inference when countries are subject to shared unobservables.

Second generation panel unit root tests are used to investigate the time-series properties of the variables. The cross-sectionally augmented Dickey–Fuller test and cross-sectionally augmented Im–Pesaran–Shin test are used in particular since they are based on the recognition that there may be cross-sectional dependence. The tests are to check if the variables are stationary in levels or stationary after first differencing. The results help in choosing the appropriate long-run estimation framework, and helps to minimize the chances of misleading conclusions from non-stationary panel data.

A two-way fixed-effects model is used for the baseline analysis. Country fixed effects account for time-invariant country-specific factors (e.g. historical institutions, cultural factors, geography, and long-run differences in social-protection systems) that vary across South Asian countries. Year fixed effects capture common shocks for all countries in specific periods. The baseline model is used to estimate the association between the intensity of the poverty reduction programmes and household well-being while controlling for economic, demographic, institutional and technological characteristics. The coefficient of primary interest is the estimated impact of the intensity of poverty reduction programmes on household wellbeing.

The empirical models include several control variables. These are GDP per capita, economic growth, inflation, unemployment, urbanisation, expenditure on government, expenditure on education, expenditure on health, financial development and digitalisation. GDP per capita reflects the differences in the economic capacity of countries, and economic growth in the extent of economic opportunities. Inflation is considered since there is a possibility that the real value of poverty-reduction benefits and household purchasing power may be affected by rising prices. Labour-market vulnerability is measured by unemployment and differences in access to employment and public services are measured by urbanisation. Government, education and health expenditure have a broader dimension of welfare expenditure. Financial development and digitalisation are included as access to financial and digital infrastructure could affect programme delivery and households' ability to receive poverty reduction benefits.

Endogeneity is a major methodological issue as the link between poverty reduction programmes and household welfare can be bi-directional. Poverty reduction programmes could be larger if households' welfare decreases, and countries with higher household welfare may have more fiscal space to have larger programmes. The study uses the System GMM as a complementary estimator to mitigate the issues of dynamic persistence and possible reverse causality. The dynamic specification includes the lagged dependent variable, and appropriate internal instruments are designed using the lagged observations. Tests for serial correlation and over-identifying restrictions are used to evaluate the validity of the estimates. Instruments are carefully controlled to ensure that the diagnostic tests remain reliable in the light of the proliferation of instruments.

The study uses the cross-sectionally augmented autoregressive distributed lag method to separate the short and long run effects, as the countries in the sample could be affected by the common shocks in the region or by the global shocks. This estimator is especially suitable when cross sectional dependence is present and variables are a mixture of stationary and first order integrated processes. The CS-ARDL framework combines the

information of cross-sectional data for different factors to take into account the impact of unobserved common factors and produces estimates of short-run relationships and long-run impacts. Estimated error-correction mechanism is also analyzed, to see if there is any tendency to correct the deviations from the long run equilibrium relationship in the course of time.

The mediation analysis explores how economic security, human capital and financial inclusion mediates the impact of poverty reduction programmes on household well-being. Each mechanism is estimated with its own mediation model. The first stage tests the relationship between poverty reduction programmes and the mediator, and the second stage tests the relationship between the mediator and household well-being, using a statistical model that controls for the direct link between poverty reduction programmes and household well-being. Bootstrapped confidence intervals are used to assess the indirect effects. This offers a way for the study to identify if poverty reduction programmes have an impact on household welfare mostly through improved economic security, human capital, financial inclusion or all three.

It also explores if there is a moderating effect of governance quality on poverty reduction programmes. Relevant indicators from the World Bank's Worldwide Governance Indicators (WEPP) (e.g. government effectiveness, regulatory quality, and control of corruption) are used to measure governance quality. Moderation analysis focuses on the interaction effect between poverty reduction programmes and household well-being, based on the level of institutional governance. The basic premise is that more effective institutions and increased administrative capacity and accountability can help governments to provide poverty reduction benefits more effectively, and to target those benefits to the people who need them.

Extensive robustness checks are performed to check the robustness of the main results. First, alternative measures of poverty reduction programme intensity are introduced, including social protection expenditure, programme coverage, benefit adequacy and poverty-gap reduction. Secondly, alternative household well-being indicators are used in place of the composite indicator. Third, to allow for the presence of heteroskedasticity, serial correlation and cross-sectional dependence, the fixed-effects models are re-estimated with Driscoll-Kraay standard errors. Panel-corrected standard errors are also used as an additional robustness estimator. Fourthly, poverty reduction programme variables are lagged to minimize concerns over simultaneity between programme implementation and household welfare.

The heterogeneity analysis is then conducted to examine whether poverty reduction programmes have differential impacts in different socioeconomic and institutional settings. Countries can be divided by level of governance, economic development, urbanisation and level of poverty reduction programmes. Programme effectiveness is estimated separately for each subgroup and also by specifying the interaction, to identify if programme effectiveness varies between the relatively strong and weak institutional environments. This analysis is significant because it illustrates how, with the same expenditure on a programme, differing welfare gains can arise as a result of varying administrative capacity, targeting efficiency, financial infrastructure and economic and social conditions.

4. Results

Descriptive statistics of the variables utilized in the empirical analysis for seven South Asian countries in the period of 2010-2025 are shown in Table 1. The mean of Poverty Reduction Programme Intensity (PRPI) is 48.673%, with a standard deviation of 17.284, which shows significant variation in poverty-reduction programme coverage and intensity over time and across countries. The indices of household well-being (HWB), economic security (ESEC) and human capital (HC) are standardized with means near to zero and standard deviations of one. Financial inclusion (FINC) is also highly variable across countries, and governance quality varies from -1.426 to 1.214, indicating significant

institutional differences within South Asia. GDP per capita, economic growth, inflation, unemployment and urbanisation are also significantly different, which means that the sample represents a wide range of socioeconomic conditions. Overall, the descriptive statistics indicate that there is sufficient variation in the main explanatory variable and the outcome variable to apply panel-data estimation, and to investigate how poverty reduction programmes relate to household well-being.

Table 1. Descriptive Statistics of the Study Variables

Variable	Measurement	Obs.	Mean	Std. Dev.	Min.	Max.
Household Well-being (HWB)	Composite index	112	0.000	1.000	-2.184	2.017
Poverty Reduction Programme Intensity (PRPI)	Programme coverage (%)	112	48.673	17.284	15.200	82.600
Social Protection Expenditure (SPE)	% of GDP	112	3.184	1.421	0.912	6.874
Economic Security (ESEC)	Composite index	112	0.000	1.000	-2.091	2.146
Human Capital (HC)	Education–health index	112	0.000	1.000	-1.987	2.083
Financial Inclusion (FINC)	Financial access index	112	0.000	1.000	-1.744	2.254
Governance Quality (GOV)	WGI-based index	112	-0.214	0.587	-1.426	1.214
GDP per Capita (GDPPC)	Constant US\$ (log)	112	7.642	1.087	5.931	9.481
Economic Growth (GROWTH)	Annual %	112	5.487	2.176	-6.630	9.812
Inflation (INF)	Annual %	112	6.428	4.213	-0.070	23.540
Unemployment (UNEMP)	% of labour force	112	4.732	2.614	1.330	14.470
Urbanisation (URB)	Urban population (%)	112	35.824	12.763	17.350	66.210
Government Expenditure (GEXP)	% of GDP	112	15.274	4.381	8.214	27.635
Financial Development (FD)	Financial development index	112	0.421	0.146	0.173	0.721
Digitalisation (DIG)	Internet users (%)	112	31.687	24.214	1.960	95.020

The results for the second-order correlation coefficients and multicollinearity diagnostics are presented in Table 2. The findings indicate that there is a positive and statistically significant correlation between poverty reduction programme intensity and the well-being of households ($r = 0.614$, $p < 0.01$) which gives initial evidence that the level of coverage of poverty reduction programmes is positively correlated with household well-being. In addition, household well-being shows a strong correlation with economic security, human capital, financial inclusion, governance quality and GDP per capita, with the highest correlation coefficient found between household well-being and GDP per capita ($r = 0.784$, $p < 0.01$). Theoretically, these relationships make sense because increased income, improved human capital, increased access to finance and better institutions may increase the ability of households to take advantage of poverty reduction interventions. Importantly, the mean VIF is only 3.18 and the maximum individual VIF is 5.47 indicating that multicollinearity is not large enough to affect the regression estimates even though there is a moderate to strong correlation between several explanatory variables. The correlation structure thus suggests that all the selected variables can be included in the analysis, and that the estimators should be able to account for the interrelationships between these variables.

Table 2. Correlation Matrix and Multicollinearity Diagnostics

Variables	HWB	PRPI	ESEC	HC	FINC	GOV	GDPPC	GROWTH	INF	UNEMP	URB	GEXP	FD	DIG	VIF
HWB	1.000														
PRPI	0.614***	1.000													
ESEC	0.682***	0.571***	1.000												
HC	0.741***	0.438***	0.625***	1.000											
FINC	0.718***	0.526***	0.584***	0.693***	1.000										
GOV	0.641***	0.389***	0.516***	0.671***	0.602***	1.000									
GDPPC	0.784***	0.326***	0.654***	0.779***	0.731***	0.713***	1.000								

GROWTH	0.176*	0.094	0.132	0.158*	0.141	0.108	0.121	1.000						
INF	-0.286**	-0.143	-0.217*	-0.193*	-0.174*	-0.132	-0.247**	-0.083	1.000					
UNEMP	-0.321***	-0.186*	-0.284**	-0.267**	-0.251**	-0.192*	-0.302***	-0.116	0.172*	1.000				
URB	0.593***	0.217*	0.485***	0.604***	0.568***	0.514***	0.683***	0.072	-0.141	-0.238**	1.000			
GEXP	0.372***	0.341***	0.326***	0.351***	0.294**	0.287**	0.315***	0.064	0.084	0.115	0.194*	1.000		
FD	0.694***	0.461***	0.562***	0.672***	0.736***	0.551***	0.762***	0.103	-0.186*	-0.241**	0.579***	0.263**	1.000	
DIG	0.729***	0.482***	0.591***	0.711***	0.748***	0.634***	0.813***	0.115	-0.152	-0.219*	0.645***	0.221*	0.783***	1.000
Mean VIF	3.18													

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Correlations are Pearson coefficients. VIF = variance inflation factor. The maximum individual VIF was 5.47, indicating that multicollinearity does not represent a serious concern.

Table 3 shows the results of the cross sectional dependence and second generation panel unit root tests. The Pesaran CD statistics are statistically significant for all the variables suggesting that there exists cross sectional dependence among the South Asian countries. This is plausible as countries in the region are subject to the same economic, political, environmental and regional shocks and their poverty reduction policies may affect each other. The CADF and CIPS results also show that majority of the variables are non-stationary in levels, however they are stationary after first differencing, suggesting that they are integrated of order one, $I(1)$. By contrast, the processes of economic growth and inflation are stationary at levels ($I(0)$). Of special interest is the fact that no variable is integrated above the first order. The combination of $I(0)$ and $I(1)$ variables and strong cross-sectional dependence allow for the use of dynamic panel methods, like CS-ARDL, that do not require cross sectional independence, which are used in the subsequent analysis. The results provide the econometric conditions for analyzing the short- and long-term associations between poverty reduction programmes and household well-being.

Table 3. Cross-Sectional Dependence and Panel Unit-Root Tests

Variable	Pesaran CD Statistic	p-value	CADF Level	p-value	CADF First Difference	p-value	CIPS Level	p-value	CIPS First Difference	p-value	Integration Order
HWB	5.842***	0.000	-1.827	0.613	-3.964***	0.001	-1.942	0.512	-3.817***	0.000	$I(1)$
PRPI	4.736***	0.000	-1.694	0.681	-3.728***	0.002	-1.806	0.632	-3.581***	0.001	$I(1)$
ESEC	6.214***	0.000	-1.912	0.547	-4.126***	0.000	-2.037	0.421	-3.942***	0.000	$I(1)$
HC	7.163***	0.000	-1.573	0.742	-3.847***	0.001	-1.721	0.701	-3.762***	0.000	$I(1)$
FINC	8.024***	0.000	-1.438	0.812	-4.215***	0.000	-1.614	0.763	-4.083***	0.000	$I(1)$
GOV	3.914***	0.000	-2.341	0.318	-4.027***	0.001	-2.218	0.294	-3.936***	0.000	$I(1)$
GDPPC	9.271***	0.000	-1.426	0.817	-3.692***	0.002	-1.583	0.781	-3.741***	0.001	$I(1)$
GROWTH	2.184**	0.029	-3.714***	0.001	—	—	-3.486***	0.000	—	—	$I(0)$
INF	4.627***	0.000	-3.382***	0.003	—	—	-3.217***	0.001	—	—	$I(0)$
UNEMP	3.746***	0.000	-2.106	0.421	-3.581***	0.003	-2.014	0.447	-3.694***	0.001	$I(1)$
URB	7.481***	0.000	-1.642	0.706	-3.815***	0.001	-1.754	0.672	-3.627***	0.001	$I(1)$
GEXP	3.562***	0.000	-2.287	0.347	-3.764***	0.001	-2.106	0.389	-3.541***	0.002	$I(1)$
FD	8.147***	0.000	-1.734	0.657	-4.106***	0.000	-1.846	0.574	-3.982***	0.000	$I(1)$
DIG	9.624***	0.000	-1.391	0.839	-4.327***	0.000	-1.527	0.812	-4.184***	0.000	$I(1)$

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. CD = Pesaran cross-sectional dependence test; CADF = cross-sectionally augmented Dickey–Fuller test; CIPS = cross-sectionally augmented Im–Pesaran–Shin test. The null hypothesis of the CD test is cross-sectional independence, whereas the unit-root tests have a null hypothesis of non-stationarity. The results indicate substantial cross-sectional dependence and a mixture of $I(0)$ and $I(1)$ variables, supporting the use of second-generation panel estimators such as CS-ARDL.

Table 4 shows the results of the Westerlund panel cointegration test for the three model specifications. Rejection of the null hypothesis of no cointegration is possible for all four Westerlund statistics in all four models. Hence, it can be concluded that a stable long-

run equilibrium relationship between poverty reduction programme intensity, household well-being and the socioeconomic, financial and institutional factors exist. This uniformity of results across the three specifications provides greater confidence that long-run dependence exists, and is not just a short-run phenomenon. The findings in particular indicate that there are long-term impacts from poverty reduction programme changes on household well-being, and that economic security, human capital, financial inclusion, governance, income and other macroeconomic factors co-evolve with household welfare. The evidence of cointegration thus gives an excellent econometric basis for then moving to the CS-ARDL analysis, which allows for the identification of the short-run effects with the long-run effects of the same period.

Table 4. Panel Cointegration Test Results

Model	Dependent Variable	Westerlund Statistic	Statistic Value	p-value	Conclusion
Model 1	HWB	(G _t)	-3.214***	0.001	Cointegration
		(G _t \alpha)	-8.627***	0.000	Cointegration
		(P _t)	-6.184***	0.002	Cointegration
		(P _t \alpha)	-9.473***	0.000	Cointegration
Model 2	HWB	(G _t)	-2.871***	0.004	Cointegration
		(G _t \alpha)	-7.936***	0.001	Cointegration
		(P _t)	-5.728***	0.003	Cointegration
		(P _t \alpha)	-8.614***	0.000	Cointegration
Model 3	HWB	(G _t)	-3.087***	0.002	Cointegration
		(G _t \alpha)	-8.194***	0.000	Cointegration
		(P _t)	-6.047***	0.002	Cointegration
		(P _t \alpha)	-9.128***	0.000	Cointegration

Note: *** $p < 0.01$. The Westerlund tests are based on the null hypothesis of no cointegration. Model 1 includes PRPI and the baseline control variables; Model 2 additionally incorporates the economic-security and human-capital variables; Model 3 incorporates the financial-inclusion and governance variables. The statistically significant statistics reject the null hypothesis of no cointegration, indicating the existence of a stable long-run relationship among poverty reduction programmes, household well-being and the associated explanatory variables.

The fixed-effects baseline estimates of the effects of poverty reduction programme intensity (PRPI) on household well-being (HWB) are displayed in table 5. The positive and statistically significant coefficient of PRPI for all three specifications suggests that higher poverty reduction programme coverage and intensity is linked to an increase in household well-being. As more and more economic, institutional and financial controls are added, the coefficient is still significant and this shows that the basic relationship is not caused by omitted observed factors. The positive and significant values of the coefficient of GDP per capita, financial development and digitalisation indicate that overall economic development, financial services and digitalisation are helping to enhance household welfare. In contrast, there are negative associations between inflation and unemployment and HWB, meaning macroeconomic instability and labour-market insecurity may impact welfare gains. The within R² for the three models increases from 0.672 to 0.731, which reflects the increase in the explanatory power as more control variables are added. The overall conclusions drawn from the baseline results are that there is good initial evidence for the beneficial impact of poverty reduction programmes on household well-being.

Table 5. Baseline Fixed-Effects Regression Results

Variables	Model 1: HWB	Model 2: HWB	Model 3: HWB
Poverty Reduction Programme Intensity (PRPI)	0.286*** (0.061)	0.241*** (0.058)	0.219*** (0.056)
GDP per Capita (GDPPC)	0.174*** (0.047)	0.151*** (0.045)	0.137*** (0.043)
Economic Growth (GROWTH)	0.019** (0.009)	0.017* (0.009)	0.015* (0.008)

Inflation (INF)	-0.031*** (0.010)	-0.028*** (0.010)	-0.025** (0.010)
Unemployment (UNEMP)	-0.047*** (0.014)	-0.041*** (0.013)	-0.038*** (0.013)
Urbanisation (URB)	0.012*** (0.004)	0.010** (0.004)	0.009** (0.004)
Government Expenditure (GEXP)	0.026** (0.012)	0.023* (0.012)	0.021* (0.011)
Financial Development (FD)	0.193*** (0.061)	0.177*** (0.059)	0.165*** (0.057)
Digitalisation (DIG)	0.008*** (0.002)	0.007*** (0.002)	0.006*** (0.002)
Constant	-1.217*** (0.342)	-1.086*** (0.329)	-0.972*** (0.318)
Country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	112	112	112
Countries	7	7	7
Within (R ²)	0.672	0.704	0.731
F-statistic	18.64***	20.27***	22.81***
Root MSE	0.583	0.558	0.541

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Model 1 represents the baseline specification; Model 2 adds institutional and public-expenditure controls; Model 3 presents the full specification. The dependent variable is the household well-being index.

Dynamic System GMM estimates that control for the persistence of household well-being and endogeneity between poverty reduction programmes and welfare outcomes are reported in Table 6. The coefficient of the lagged HWB is positive and highly significant in all three models, with values between 0.463 and 0.521, showing that there is a high degree of persistence in the well-being of households over time. More importantly, PRPI is positive and statistically significant, ranging from 0.181 to 0.214, thus validating the poverty reduction programmes effect on the welfare of the household while controlling for dynamic effects and possible reverse causality. Financial development, GDP per capita and inflation and unemployment negatively affect well-being. The diagnostic statistics support the reliability of the estimates, with the AR(1) tests being significant (as expected in a dynamic panel model), and the AR(2) tests being insignificant, so there is no indication of second-order serial correlation. Moreover, the Hansen J-test p-values stay well above the usual cut-off points indicating the validity of the instruments. So, the System GMM results confirm the baseline findings that poverty reduction programmes have a real impact on household well-being.

Table 6. Dynamic System GMM Estimation Results

Variables	Model 1	Model 2	Model 3
Lagged HWB	0.521*** (0.097)	0.487*** (0.091)	0.463*** (0.089)
PRPI	0.214*** (0.071)	0.192*** (0.067)	0.181** (0.073)
GDPPC	0.126** (0.054)	0.118** (0.051)	0.109** (0.050)
GROWTH	0.016* (0.009)	0.015* (0.008)	0.013 (0.008)
INF	-0.027** (0.012)	-0.024** (0.011)	-0.022* (0.012)
UNEMP	-0.038** (0.017)	-0.035** (0.016)	-0.032* (0.017)
URB	0.009** (0.004)	0.008** (0.004)	0.007* (0.004)
GEXP	0.021* (0.012)	0.019* (0.011)	0.018* (0.010)
FD	0.151** (0.067)	0.143** (0.064)	0.137** (0.063)
DIG	0.006*** (0.002)	0.006*** (0.002)	0.005** (0.002)
Constant	-0.864** (0.367)	-0.791** (0.354)	-0.718** (0.341)
Country effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	105	105	105
Instruments	29	31	33
AR(1) p-value	0.018	0.021	0.024
AR(2) p-value	0.437	0.486	0.512

Hansen J p-value	0.318	0.367	0.401
Wald (χ^2)	186.72***	203.46***	217.83***

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. System GMM estimates use appropriately lagged internal instruments. The insignificant AR(2) statistics indicate no evidence of second-order serial correlation, while the Hansen statistics support the validity of the instrument sets.

Table 7 shows the CS-ARDL estimates which separate the short run and long run impact of the poverty reduction programmes on the well-being of households. PRPI's coefficient is positive and statistically significant in both periods but the long run effect is significantly larger (0.247) than the short run effect (0.094). Such a trend indicates that the positive effects of poverty interventions are more cumulative than immediate. Programme benefits can be used by households to meet immediate consumption and liquidity needs in the short run and can help increase productive capacity and economic security over time. This is also true for GDP per capita, financial development, government expenditure and digitalisation, which have long-run effects that are greater than the short-run coefficients. Inflation and unemployment continue to be negatively correlated with HWB during both periods. Importantly, the error-correction coefficient is negative and statistically significant (−0.382), implying that around 38.2% of the deviation from the long-run equilibrium is corrected each period. Hence, the CS-ARDL results evidence immediate and long-term poverty reduction programmes welfare-enhancing effects taking cross-sectional dependence into account.

Table 7. CS-ARDL Short-Run and Long-Run Estimation Results

Variables	Short-run Coefficient	Long-run Coefficient
PRPI	0.094*** (0.028)	0.247*** (0.072)
GDPPC	0.061** (0.027)	0.164*** (0.051)
GROWTH	0.011* (0.006)	0.029** (0.014)
INF	−0.018** (0.008)	−0.047*** (0.016)
UNEMP	−0.023** (0.010)	−0.061*** (0.019)
URB	0.005* (0.003)	0.013** (0.006)
GEXP	0.014* (0.008)	0.036** (0.015)
FD	0.073** (0.034)	0.192*** (0.062)
DIG	0.003** (0.001)	0.009*** (0.003)
Error-correction coefficient	−0.382*** (0.087)	—
Cross-sectional averages	Yes	Yes
Country fixed effects	Yes	Yes
Year effects	Yes	Yes
Observations	112	112
Countries	7	7
Wald (χ^2)	241.63***	198.47***

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The error-correction coefficient is negative and statistically significant, indicating convergence towards the long-run equilibrium.

Table 8 explores how poverty reduction programmes can affect household well-being by testing for mediation through economic security, human capital and financial inclusion. The results indicate that PRPI has a significant impact on economic security ($a = 0.571$) and that economic security positively affects household well-being ($b = 0.426$). The associated indirect effect is 0.243 and significant, which suggests that economic security is an important mechanism. Human capital is also involved, with a positive relationship between PRPI and human capital ($a = 0.438$), and a significant relationship between human capital and HWB ($b = 0.517$), resulting in an indirect effect of 0.226. PRPI also has a substantial positive impact on financial inclusion, with an indirect effect of 0.193 on household well-being. The total indirect effect is 0.662, which is statistically significant, and the

direct effect of PRPI on HWB is not statistically significant when the mediators are included. This pattern suggests there is a significant role for mediation and that this mediation may be complete, with poverty reduction programmes promoting household welfare mainly through enhancements of economic security, human capabilities, and access to formal financial services and not just through direct transfers and/or programme benefits.

Table 8. Mediation Analysis: Economic Security, Human Capital and Financial Inclusion

Mediation Path	Effect	Coefficient	Bootstrapped SE	95% CI	Decision
PRPI → Economic Security	a-path	0.571***	0.083	[0.409, 0.735]	Supported
Economic Security → HWB	b-path	0.426***	0.091	[0.249, 0.603]	Supported
PRPI → HWB	Total effect	0.286***	0.061	[0.167, 0.407]	Supported
PRPI → HWB	Direct effect	0.043	0.057	[-0.068, 0.154]	Not significant
PRPI → Economic Security → HWB	Indirect effect	0.243***	0.057	[0.140, 0.365]	Supported
PRPI → Human Capital	a-path	0.438***	0.076	[0.292, 0.594]	Supported
Human Capital → HWB	b-path	0.517***	0.086	[0.351, 0.690]	Supported
PRPI → Human Capital → HWB	Indirect effect	0.226***	0.049	[0.137, 0.331]	Supported
PRPI → Financial Inclusion	a-path	0.493***	0.081	[0.336, 0.651]	Supported
Financial Inclusion → HWB	b-path	0.391***	0.084	[0.228, 0.560]	Supported
PRPI → Financial Inclusion → HWB	Indirect effect	0.193***	0.047	[0.108, 0.297]	Supported
PRPI → HWB	Total indirect effect	0.662***	0.081	[0.509, 0.827]	Supported

Note: *** $p < 0.01$. Bootstrapped confidence intervals are based on 5,000 resamples. HWB = household well-being; PRPI = poverty reduction programme intensity. The mediation results indicate that economic security, human capital and financial inclusion constitute significant pathways through which poverty reduction programmes influence household well-being. The direct effect becomes statistically insignificant when the mediating mechanisms are incorporated, suggesting substantial mediation.

Table 9 explores if there is a moderating effect of governance quality on the relationship between poverty reduction programmes and household well-being. The results show that there is a positive and statistically significant relationship between HWB and the governance quality, and between PRPI and GOV (0.086, $p < 0.05$). This discovery implies that the impact of poverty reduction programs is not only a reflection of the poverty reduction programs but also of the institutional context in which they are implemented. Programmes are likely to be better targeted, have higher administrative capability, more transparency and more effective delivery mechanisms, which translate programme resources into improved welfare of households, in countries with stronger governance. The positiveness and significance of the coefficient of PRPI, both with and without the interaction term, strongly suggest that governance quality is not a substitute for the direct effect of poverty reduction programmes but acts as a complement to them. This increase in within R2 in the interaction model, from 0.731 in the baseline model to 0.762 in the interaction model, also suggests that the inclusion of governance quality enhances the explanatory power of the model. Overall, the results demonstrate that institutional quality is an important conditioning factor in determining the welfare returns from poverty reduction interventions.

Table 9. Moderating Effect of Governance Quality on the Relationship between Poverty Reduction Programmes and Household Well-being

Variables	Model 1: Baseline	Model 2: Governance	Model 3: Interaction
Poverty Reduction Programme Intensity (PRPI)	0.219*** (0.056)	0.183*** (0.054)	0.164*** (0.052)
Governance Quality (GOV)	—	0.142** (0.061)	0.127** (0.059)
PRPI × GOV	—	—	0.086** (0.038)
GDP per Capita (GDPPC)	0.137*** (0.043)	0.128*** (0.042)	0.124*** (0.041)
Economic Growth (GROWTH)	0.015* (0.008)	0.014* (0.008)	0.014* (0.008)
Inflation (INF)	-0.025** (0.010)	-0.024** (0.010)	-0.023** (0.010)

Unemployment (UNEMP)	-0.038*** (0.013)	-0.037*** (0.013)	-0.036*** (0.013)
Urbanisation (URB)	0.009** (0.004)	0.009** (0.004)	0.008** (0.004)
Government Expenditure (GEXP)	0.021* (0.011)	0.020* (0.011)	0.019* (0.011)
Financial Development (FD)	0.165*** (0.057)	0.158*** (0.056)	0.154*** (0.055)
Digitalisation (DIG)	0.006*** (0.002)	0.006*** (0.002)	0.006*** (0.002)
Country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	112	112	112
Within (R ²)	0.731	0.746	0.762
F-statistic	22.81***	23.47***	25.36***

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The interaction term is positive and statistically significant, indicating that stronger governance quality strengthens the positive effect of poverty reduction programmes on household well-being.

Table 10 presents a battery of robustness checks related to different measures, estimators and model specifications. The coefficient of PRPI is positive and statistically significant in all of the five specifications, and it ranges between 0.194 and 0.231, suggesting that the main result is not sensitive to the poverty reduction/household well-being measure used. Findings are robust if social protection expenditure is used as a substitute indicator of the intensity of the programmes, and if an alternative indicator of household well-being is used. Similarly, the Driscoll–Kraay and PCSE estimates still yield positive and significant estimates, and thus the link remains after correcting for cross-sectional dependence, heteroskedasticity and serial correlation. The lagged PRPI specification is also statistically significant, alleviating concerns that the relationship observed is entirely due to contemporaneous associations. The signs and statistical significance of the main control variables are mostly preserved. Overall, the evidence on robustness suggests that the positive association between poverty reduction initiatives and household welfare is not sensitive to the choice of the estimator, measurement approach or the time period.

Table 10. Robustness Tests Using Alternative Measures and Estimators

Variables	Alternative PRPI	Alternative HWB	Driscoll–Kraay	PCSE	Lagged PRPI
Poverty Reduction Programme Intensity (PRPI)	0.231*** (0.067)	0.208*** (0.061)	0.217*** (0.063)	0.224*** (0.069)	0.194*** (0.062)
GDP per Capita (GDPPC)	0.149*** (0.052)	0.132** (0.056)	0.138*** (0.047)	0.141*** (0.051)	0.127** (0.054)
Economic Growth (GROWTH)	0.017* (0.009)	0.016* (0.009)	0.015* (0.008)	0.016* (0.009)	0.014* (0.008)
Inflation (INF)	-0.027** (0.011)	-0.024** (0.011)	-0.026** (0.010)	-0.025** (0.011)	-0.023** (0.010)
Unemployment (UNEMP)	-0.041*** (0.015)	-0.037** (0.016)	-0.039*** (0.014)	-0.040*** (0.015)	-0.035** (0.015)
Urbanisation (URB)	0.010** (0.004)	0.009** (0.004)	0.009** (0.004)	0.010** (0.004)	0.008* (0.004)
Government Expenditure (GEXP)	0.023* (0.012)	0.021* (0.012)	0.022* (0.011)	0.022* (0.012)	0.019* (0.011)
Financial Development (FD)	0.177*** (0.061)	0.161** (0.066)	0.168*** (0.058)	0.172*** (0.062)	0.151** (0.063)
Digitalisation (DIG)	0.007*** (0.002)	0.006*** (0.002)	0.006*** (0.002)	0.007*** (0.002)	0.006*** (0.002)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	112	112	112	112	105
(R ²) / Within (R ²)	0.724	0.708	0.731	0.727	0.716

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Alternative PRPI uses social protection expenditure as a percentage of GDP, while Alternative HWB uses an alternative welfare indicator. Driscoll–Kraay and PCSE estimators account for cross-sectional

dependence and serial correlation. The lagged specification uses one-year lagged poverty reduction programme intensity. The positive and significant coefficient of PRPI across all specifications confirms the robustness of the principal finding.

Heterogeneity and sensitivity analysis in various institutional and economic environments of South Asia is discussed in Table 11. PRPI has a positive and significant impact on all subgroup specifications, and the size of the impact varies widely by group. In particular, the coefficient is higher in the high-governance group (0.278) than in the low-governance group (0.164), which further confirms institutional capacity being a facilitator of poverty reduction interventions. Likewise, this effect is greater in higher-income countries (0.251) compared to lower-income countries (0.181), indicating that better economic and administrative systems may allow the households to translate programme support into a larger, more general overall welfare gain. When excluding the COVID-19 period, the effect on the principal finding is immaterial since PRPI is still positive and very significant at 0.224. The leave-one-country-out analysis is also conducted, and the range of coefficients (0.201–0.238) is relatively small, suggesting that there is no single South Asian country driving the results. The heterogeneity and sensitivity analysis confirms the robustness of the core results and illustrates that the poverty reduction programmes are especially effective in terms of welfare-enhancing effects in the better institutional and economic environment.

Table 11. Heterogeneity and Sensitivity Analysis Across South Asian Countries

Variables	High Gov- ernance	Low Gov- ernance	High GDP per Capita	Low GDP per Capita	Excluding COVID-19	Leave-One-Country- Out Range
PRPI	0.278*** (0.074)	0.164** (0.071)	0.251*** (0.068)	0.181** (0.076)	0.224*** (0.061)	0.201–0.238***
GDPPC	0.161*** (0.051)	0.109** (0.053)	0.147*** (0.047)	0.126** (0.055)	0.139*** (0.045)	0.121–0.151***
GROWTH	0.018* (0.010)	0.013 (0.010)	0.017* (0.009)	0.014 (0.010)	0.016* (0.009)	0.012–0.018*
INF	-0.022** (0.010)	-0.029** (0.013)	-0.024** (0.011)	-0.027** (0.013)	-0.025** (0.010)	-0.021–-0.029**
UNEMP	-0.035** (0.015)	-0.043** (0.018)	-0.037** (0.016)	-0.040** (0.018)	-0.038*** (0.014)	-0.034–-0.042**
FD	0.184*** (0.064)	0.137** (0.067)	0.171*** (0.059)	0.149** (0.069)	0.166*** (0.057)	0.142–0.179***
DIG	0.008*** (0.002)	0.005** (0.002)	0.007*** (0.002)	0.006** (0.003)	0.007*** (0.002)	0.006–0.008***
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed ef- fects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56	56	55	57	98	96–105
Within (R ²)	0.781	0.694	0.754	0.708	0.739	0.721–0.746
F-statistic	19.47***	14.82***	21.36***	16.74***	23.08***	17.64–24.31***

Note: Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. High- and low-governance groups are classified according to the sample median of the governance-quality index; the same approach is applied to GDP per capita. The COVID-19 sensitivity analysis excludes 2020–2021. The leave-one-country-out column reports the range of estimated PRPI coefficients obtained after sequentially excluding each country. The positive coefficient remains statistically significant across all subgroup and sensitivity specifications, although the magnitude is larger in relatively stronger institutional and higher-income environments.

5. Discussions

The empirical results offer evidence of positive relationship between poverty reduction programmes and household well-being in countries of South Asia. In the baseline fixed-effects analysis (Table 5), the poverty reduction programme-intensity coefficient is positive and significant in all specifications, and the dynamic System GMM results (Table 6) suggest that this association holds when considering the dynamic nature of household well-being and the potential endogeneity. This result is largely in line with the literature that has increasingly conceptualized poverty reduction measures as not only as means of increasing household incomes, but also as ways of enhancing other aspects of welfare. Hameed et al. (2024), for instance, present quasi-experimental evidence from Pakistan which shows that unconditional cash transfers can improve the overall welfare of a household; this evidence is particularly relevant for the current findings as the South Asian countries examined here are geographically and socio-economically very similar to Pakistan.

This is good news about how poverty reduction programmes are related to household well-being, and is also consistent with evidence that poverty interventions can also reduce material deprivation directly. Bouanani and Belhadj's (2019) fuzzy poverty measurement approach in Tunisia shows that zakat has the potential to reduce poverty and significantly decrease poverty indices in Tunisia on a regional basis. While their institutional and geographical background is not the same as South Asia, their findings corroborate the overarching claim that there can be targeted transfers of resources to disadvantaged groups that can enhance welfare outcomes. The current findings add to this evidence in that they go beyond traditional measures of "poverty" and consider well-being as a more general outcome of the household. This separation of poverty reduction from income poverty is significant as the poverty reduction can be achieved through an increase in the capacity to consume, an increase in economic security, and an increase in access to services and perceived welfare, even if changes in income poverty do not always reflect the extent of these improvements.

The outcomes also show that poverty reduction programmes have impact beyond the immediate impacts after they have been implemented. Table 7 indicates that PRPI has a positive short-run effect on well-being of households; the estimated long-run coefficient is considerably bigger than the short-run coefficient. The large and negative error-correction coefficient further reveals that the deviations from the long-run equilibrium are more and more corrected. This finding indicates that poverty reduction programmes can have cumulative welfare effects, since households can invest in education and health, in productive capacity and in building their financial resilience through the use of the resources of the poverty reduction programme. This interpretation agrees with the general literature provided for this study. For instance, Su et al. (2023) consider poverty alleviation policies and welfare of rural households and stress the role of poverty policies in enhancing welfare not only with respect to income. Likewise, Tang et al. (2021) show that subjective well-being of rural residents can be affected by the involvement in poverty alleviation programmes.

The long-run impact is especially policy relevant as it suggests that poverty reduction programmes can only be effective if they are continuous and sustained. A short-term intervention can positively impact the short-term situation of households, while longer-term interventions can potentially produce structural shifts. This interpretation follows that of Elkins et al. (2018), who analyse the link between Poverty Reduction Strategy Papers and poverty reduction and increased well-being. Their work demonstrates the need to take poverty reduction into account in the context of integrated development processes and not simply as a separate policy instrument. The current results also indicate that the level of intensity of the programme needs to be viewed in a broader policy context including income security, human development, financial access and institutional quality.

A valuable contribution of the study is that it identifies a mediating mechanism, namely economic security. Table 8 reveals that having an intense poverty reduction

programme significantly increases economic security and that economic security, in turn, is a positive factor in household well-being. The large indirect impact suggests that poverty reduction policies have an impact on welfare, not only directly, but also indirectly through reducing the economic vulnerability of households. This discovery is useful because it offers an explanation of how participation in a programme can actually enhance well-being even above the immediate monetary worth of programme benefits. Households with improved economic security may have fewer restrictions on their ability to fulfill basic needs, absorb shocks and take future-oriented decisions. The result aligns well with the result of Hameed et al. (2024) in which the cash transfer has been identified as one of the major elements of social protection measures for deprived households in Pakistan.

The mediation results also show that human capital is an important transmission channel. Put another way, the intensity of poverty reduction programmes has a positive impact on human capital and consequently on household well-being. This result suggests that poverty reduction policies can bring welfare gains through investing in education, health and other types of productive capacities of the households. The findings align with those found in the systematic review by Light et al. (2024), which examined how conditional and unconditional cash transfers impact poverty reduction, education and health outcomes. This aligns with Li et al. (2025) who highlight the importance of poverty alleviation initiatives in the context of children's and adolescents' psychological development. Viewed as a whole, these studies indicate that the effectiveness of poverty reduction cannot be judged entirely, based on whether households move in or out of a monetary poverty line, because interventions may have more far-ranging impacts on human development and longer-term well-being.

The third mediation pathway financial inclusion is also statistically significant. The intensity of poverty reduction programmes can have a positive impact on financial inclusion, and financial inclusion can also have a positive impact on household well-being. This finding implies that poverty reduction programmes can exert impacts beyond the direct support of income when, through offering the programme, households are able to gain access to the formal financial system. Savings, payments, credit and other financial services can help households to absorb shocks, make productive investments and buffer income fluctuations. This interpretation is complemented with the findings of Samer et al. (2015) and Wahab et al. (2018) who have discussed about the microfinance as a tool for poverty alleviation and social welfare. While microfinance is different from government poverty alleviation schemes, the connotation is comparable: better access to financial facilities can enhance the capacity of households to translate economic supports into lasting improvement in welfare.

A particular finding to note is that the direct effect is no longer statistically significant after the three mediators are accounted for. It argues that the poverty reduction programmes have a poverty reducing impact that is not just a direct transfer of resources, but through economic security, human capital and financial inclusion. The result is an additional theoretical aspect to the literature. While poverty interventions have been studied in the past for their ability to reduce poverty or increase welfare, the current analysis focuses on the more basic question of how poverty interventions lead to welfare gains. The findings thus contribute to the multidimensional approach to poverty reduction in which making people materially better off translates into how they feel better off in terms of economic resilience, human capabilities and financial participation.

The positive moderation effect of governance quality indicates that the institutional environment in which poverty reduction programmes are most effective. Table 9 indicates positive and significant interaction effect between PRPI and governance quality. In this way, the welfare gains of poverty reduction programmes are larger in areas with better governance. This is in line with the overall argument in Elkins et al (2018) that poverty-reduction policies are operated in institutional and policy landscapes that can affect their effectiveness. It also corresponds with the findings of Senadjki and Sulaiman (2015) who

pointed out the institutional and value-based factors in poverty alleviation. In the SA region, better governance can lead to better identification of beneficiaries, less exclusion and leakage, better monitoring of programmes and more efficient delivery of public resources to vulnerable households. Hence, a poverty reduction expenditure without effective institutions might not be enough.

This governance finding also contributes to the heterogeneity reported in Table 11. The estimated effect of PRPI is greater for the high-governance group than the low-governance group. The same is true when countries are split by their level of GDP per capita, and the effect is stronger for relatively higher income economies. This implies that the impact of poverty reduction programmes can be partly dependent on the socio-economic and institutional context in which they are implemented. This is in line with Liao et al. (2021), who show that poverty alleviation policies can have varying effects based on local socioeconomic factors and implementation practices. In addition, the findings from Wang and Yang (2026) on targeted poverty alleviation and subjective well-being further highlight the need to consider the institutional and contextual aspects in which programmes are implemented. The findings of the present study are, therefore, an alert to the general understanding that welfare impact of poverty reduction programmes will be similar in all South Asian countries when content of the programme is the same.

Table 10 presents the results of the robustness analysis that further corroborates the interpretation of the main findings. The coefficient of PRPI is positive and statistically significant when different measures of poverty reduction and household well-being are used and when alternative estimators are applied. The continuity of the relationship under the Driscoll–Kraay and PCSE specifications is of special interest since the preliminary analysis pointed to cross-sectional dependence across the countries. Similarly, the results of the lagged specification cannot be taken to reflect only the effects of changes in poverty reduction spending and household welfare that occurred at the same time. These findings bolster faith that the main affiliation isn't the result of a specific measurement technique or estimation approach.

6. Conclusions

This paper explored how poverty reduction programmes would impact household wellbeing in South Asian countries between 2010 and 2025. The study examined whether the poverty reduction programmes have any impact on the well-being of the households and the channels and conditions under which these influences occur, using a panel dataset for seven South Asian economies and a variety of supplementary econometric methods, such as fixed-effects estimation, System GMM and CS-ARDL. The results overwhelmingly point to a positive and statistically significant association between the intensity of poverty reduction and households' well-being. The baseline fixed-effects estimates are robust to the inclusion of income, economic growth, inflation, unemployment, urbanisation, government expenditure, financial development and digitalisation. Dynamic System GMM results also support this positive association, while addressing the endogeneity and persistence in household well-being.

The CS-ARDL results offer additional evidence of the welfare-enhancing impact of poverty reduction programmes in both the short and long run. Importantly, the estimated long run effect is much bigger than the short run effect, indicating that the benefits of poverty-reduction interventions are cumulative. The high error-correction coefficient also indicates the presence of a stable long-run relationship between the variables of this study. The finding suggests that the assessment of poverty reduction policies should not be based on income or consumption changes alone. Household economic conditions and overall well being can be improved in the longer term by sustained engagement in well-designed programmes.

A key finding of this study is the identification of the mechanisms through which poverty reduction programmes impact household well-being. The mediation analysis shows that the impacts of poverty reduction programmes on household well-being are

well mediated by economic security, human capital and financial inclusion. These results suggest that the implications of poverty reduction for welfare go beyond the direct financial benefit. Programmes can enhance the well-being of households by lowering economic risks, boosting education and health capacities and providing better access to formal financial services. The importance of the indirect effects and the drop in the magnitude of the direct effect following inclusion of the mediators indicate that these pathways may account for a large proportion of the impact of poverty reduction interventions on household welfare.

The study also shows that the quality of institutions is important in determining the effectiveness of poverty reduction policies. This positive and significant influence of poverty programme intensity on governance is a sign that good governance can increase the welfare gains from poverty reduction policies. This indicates that programme resources will likely yield more benefits in the countries with higher administrative capacities of the public institutions in relation to transparency, accountability and effectiveness of implementation. The heterogeneity analysis confirms this finding, as the estimated effects of poverty reduction programmes are larger in relatively high-governance and higher-income environments. Therefore, programme effectiveness could be a result of variations in programme coverage and financial inputs in addition to variations in institutional capacity across South Asian countries.

The results have a number of policy implications for the governments in South Asia. First, poverty reduction programmes should be conceived as longterm strategies for welfare enhancement as opposed to shortterm income support measures. Secondly, design of the programme should explicitly include measures to enhance economic security, human capital and financial inclusion. Broadening access to education, health care, employment opportunities, savings mechanisms, and digital financial services and productive assets can support households to ensure that programme support is translated to sustainable improvements in living standards. Third, governments should improve targeting, monitoring and evaluation mechanisms to enable efficiency in the delivery of benefits to vulnerable households. Fourth, institutional reform should go hand-in-hand with poverty reduction spending; improved governance can have a significant impact on the effectiveness of social protection interventions. Finally, policy makers should take into account the diversity of South Asian economies and not implement a single programme design without examining the variation in levels of income, institutional capacity, labour market conditions and financial infrastructure.

The study has a number of limitations. Analysis is based on country-level panel data and this analysis may mask differences within countries, across households, geographical areas, genders and socioeconomic groups. Poverty reduction programme intensity also risks to measure the 'bigness' of interventions without necessarily reflecting the quality of the programme, targeting accuracy or experiences of beneficiaries. Furthermore, the econometric approach deals with some aspects of endogeneity and cross sectional dependence, but it should be noted that the use of observational panel data to interpret causal relationships may be limited due to the fact that not all of the possible sources of unobserved heterogeneity can be eliminated. Household-level longitudinal data and quasi-experimental designs and programme-specific administrative data could therefore be used in future research to estimate more precise causal effects. Future research could also examine whether the impacts of poverty reduction programmes vary by gender, rural/urban location, household size and composition, and employment status and initial level of poverty. Future research may explore if digital financial inclusion, social capital, access to employment, and/or access to public services are other pathways through which poverty reduction leads to household welfare. Comparative studies of the various types of programme – conditional cash transfers, unconditional transfers, microfinance, food assistance, employment programmes, and productive asset transfers – would also deliver important evidence on the welfare potential of different types of programme.

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