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Public Expenditure on Social Services and Human Development in Andhra Pradesh: An Assessment Using the UNDP Expenditure Ratios

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Abstract

Public spending on social services is the main fiscal channel through which a sub-national government can influence human development. This paper assesses the fiscal commitment of Andhra Pradesh to human development in the ten years after state bifurcation (2014-15 to 2023-24), using the four expenditure ratios proposed in UNDP's *Human Development Report 1991*: the Public Expenditure Ratio (PER), Social Allocation Ratio (SAR), Social Priority Ratio (SPR) and Human Expenditure Ratio (HER), with indicative norms of 25, 40, 50 and 5 per cent. Using budget data and Gross State Domestic Product (GSDP) estimates, the paper compares two five-year sub-periods (2014-15 to 2018-19 and 2019-20 to 2023-24), estimates linear trends, and decomposes the change in HER. PER fell from a mean of 22.6 per cent to 17.9 per cent and exceeded its norm only in 2014-15. SAR rose from 27.9 to 37.5 per cent and crossed its norm only in 2023-24 (revised estimates). SPR fell from 57.4 to 49.2 per cent and dropped below its norm in 2022-23 and 2023-24. HER averaged 3.6 per cent and 3.3 per cent in the two sub-periods and never reached 5 per cent; the difference in sub-period means is not statistically significant, but the ten-year trend (-0.09 percentage points a year) is. A decomposition shows that the shrinking size of the budget relative to GSDP and the erosion of the priority-sector share outweighed the rise in the social-services share. Raising the social-services share alone is therefore insufficient; progress towards the norm requires protecting education and health spending within a larger and fiscally sustainable expenditure envelope.

Keywords: *public expenditure; human development; social allocation ratio; social priority ratio; human expenditure ratio; Andhra Pradesh; state finances*

JEL classification: H51, H52, H72, O15

1. Introduction

Human development, understood as the expansion of the capabilities people have reason to value (Sen, 1999), depends heavily on education, health and basic services that markets alone provide inadequately. Externalities and information problems weaken private provision, and poorer households rely more than richer households on publicly provided services (NITI Aayog, 2017). Cross-country evidence indicates that public spending on health and the incomes of the poor, rather than average income alone, account for much of the variation in human development

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achievements (Anand and Ravallion, 1993), and that human development and economic growth reinforce each other (Ramirez, Ranis and Stewart, 2000). In India, the adequacy of public provision of health and education has been a recurring concern (Dreze and Sen, 2013), and because most of this provision is delivered through State governments, State budgets are where the commitment to human development is expressed in practice.

The Andhra Pradesh Reorganisation Act, 2014 divided the erstwhile State with effect from 2 June 2014 and created the residuary State of Andhra Pradesh. The successor State had to establish its fiscal and administrative arrangements afresh while sustaining a large programme of social services. These include health interventions such as the promotion of institutional deliveries, community health workers (ASHAs), immunisation and the Mother and Child Tracking System; education programmes under the Right of Children to Free and Compulsory Education Act, 2009, Sarva Shiksha Abhiyan, the Mid-Day Meal Scheme and the Kasturba Gandhi Balika Vidyalayas; employment support under the Mahatma Gandhi National Rural Employment Guarantee Scheme; and food security under the National Food Security Act, 2013. Many of these are centrally sponsored. The existence of schemes, however, says little about the weight the State's budget places on human development. That weight is the subject of this paper.

The paper addresses four questions for 2014-15 to 2023-24. First, how do Andhra Pradesh's PER, SAR, SPR and HER compare with the norms in the *Human Development Report 1991*? Second, did the ratios differ significantly between the first and second halves of the decade? Third, what are their trends? Fourth, which component of the HER, namely the size of the budget, the share of social services, or the share of priority sectors, explains its movement? Answering the fourth question is the main addition to a purely descriptive comparison with norms: it shows which fiscal choices, rather than which ratios, account for the shortfall.

The remainder of the paper is organised as follows. Section 2 sets out the conceptual framework and reviews related work. Section 3 describes the data and methods. Section 4 presents the results for each ratio and for the decomposition. Section 5 concludes with policy implications and limitations.

2. Conceptual Framework and Review of Literature

2.1 The UNDP expenditure ratios

The *Human Development Report 1991* proposed four ratios to indicate the priority that governments give to human development in their budgets:

(i) The **Public Expenditure Ratio (PER)** is total government expenditure as a percentage of GDP (here, GSDP).

(ii) The **Social Allocation Ratio (SAR)** is expenditure on social services as a percentage of total government expenditure.

(iii) The **Social Priority Ratio (SPR)** is expenditure on human priority areas as a percentage of expenditure on social services.

(iv) The **Human Expenditure Ratio (HER)** is expenditure on human priority areas as a percentage of GDP.

The four ratios are linked by an identity: HER = PER × SAR × SPR (each expressed as a fraction). The report suggested that a country serious about human development should aim for a HER of about 5 per cent. This can be reached efficiently with a moderate PER of about 25 per cent, an SAR above 40 per cent and an SPR above 50 per cent, since $0.25 \times 0.40 \times 0.50 = 0.05$. The norms are drawn from the experience of developing countries that did well on human development. They are indicative benchmarks, not legal or optimal targets. They were also framed for national governments, which carry defence, debt service and other functions that states do not. Comparison of a state budget with them therefore needs care, and this is taken up in Section 5.

2.2 Related work

The IMF working paper on social sector spending in a panel of countries (2002) finds that social spending is critical because it benefits the poor relatively more than the rich and, by enhancing human capital, can produce direct

growth effects and spillovers for the wider economy. An NCAER working paper (2002) on Indian public expenditure on the social sector and poverty alleviation programmes in the 1990s reports that State expenditure on social-sector schemes was increasing, but that State governments appeared to be easing out of their constitutional commitment to sustain these programmes, and that large inter-sectoral reallocations took place within the poverty-alleviation sectors.

A NITI Aayog status paper (2017) on social sector expenditure of States before and after the Fourteenth Finance Commission (2014-15 and 2015-16) gives three reasons why government spending on the social sector matters in India: the magnitude of deprivation is too large to be left to market forces; poorer households depend more on government services; and clearly articulated outcomes, such as the Sustainable Development Goals, must be ensured. It also notes that a State's prioritisation of social spending depends on its social indicators, such as literacy and enrolment for education, and infant mortality and health infrastructure for health.

These studies establish why social spending matters and how it has behaved in India, but they do not apply the UNDP ratios to the post-bifurcation fiscal record of Andhra Pradesh or separate the effects of budget size and budget composition. This paper fills that gap.

3. Data and Methodology

3.1 Definitions and data

The analysis uses secondary data for 2014-15 to 2023-24. Expenditure data are taken from the *Budget in Brief* and other budget documents of the Government of Andhra Pradesh. GSDP at current prices is taken from the Directorate of Economics and Statistics, Andhra Pradesh, and the Socio Economic Survey and Statistical Abstract of Andhra Pradesh are used for supporting information. The first year, 2014-15, is the year in which bifurcation took effect, and 2023-24 is the latest year for which data are available; figures for 2023-24 are revised estimates (RE) rather than accounts.

Social services comprise the budget heads for: education, sports, art and culture; medical and public health; family welfare; water supply and sanitation; housing; urban development; welfare of Scheduled Castes, Scheduled Tribes and Other Backward Classes; labour and labour welfare; social security and welfare; nutrition; relief on account of natural calamities; and other social services. Rural development is not included in social services. Human priority areas are defined as (a) education, sports, art and culture, and (b) medical and public health. These are the two components most directly linked to the human capital element of human development.

This definition departs from the original UNDP concept in two ways. The *Human Development Report 1991* refers to *basic* education, primary health care, safe drinking water and nutrition. The budget heads used here include higher education and tertiary medical care, which may overstate the SPR, and they place water supply, sanitation and nutrition under social services outside the priority group, which may understate it. The SPR should therefore be read as a measure of the weight of education and health within social services, not of the weight of basic services.

3.2 Methods

All four ratios are computed for each year as defined in Section 2.1. The ten years are divided into two sub-periods of five years each: 2014-15 to 2018-19 (period I) and 2019-20 to 2023-24 (period II). The break separates the years up to 2018-19, which include the transition after bifurcation and most of the Fourteenth Finance Commission award period (2015-20), from the later years, which include the COVID-19 shock of 2020-21 and the beginning of the Fifteenth Finance Commission award period. For each sub-period, the mean, standard deviation (SD) and coefficient of variation (CV) are reported. The difference between sub-period means is tested using a two-sample t-test with equal variances (8 degrees of freedom; two-tailed critical value 2.306 at the 5 per cent level). The null hypothesis in each case is that the sub-period means are equal.

Because a split-sample comparison of two five-year groups has low power and ignores the order of the observations, the paper also fits a linear time trend to each ratio by ordinary least squares, reporting the slope in

percentage points a year, its standard error, and R-squared. Compound annual growth rates (CAGR) are reported for the underlying nominal aggregates. Finally, because the identity in Section 2.1 is multiplicative, the change in HER between 2014-15 and 2023-24 is decomposed exactly into the changes in the natural logarithms of PER, SAR and SPR.

4. Results and Discussion

4.1 Public Expenditure Ratio (PER)

Table 1 presents the PER. The mean PER fell from 22.58 per cent in period I to 17.90 per cent in period II, a fall of 4.68 percentage points that is statistically significant (t = -2.80). The PER exceeded the 25 per cent norm only in 2014-15 (26.37 per cent). It was within 0.7 points of the norm in 2015-16 and 2016-17 (24.73 and 24.36 per cent), then fell by 5.7 points in 2017-18 to 18.69 per cent and stayed between 16.7 and 19.1 per cent thereafter.

Table 1: Public Expenditure Ratio (PER) of Andhra Pradesh, 2014-15 to 2023-24

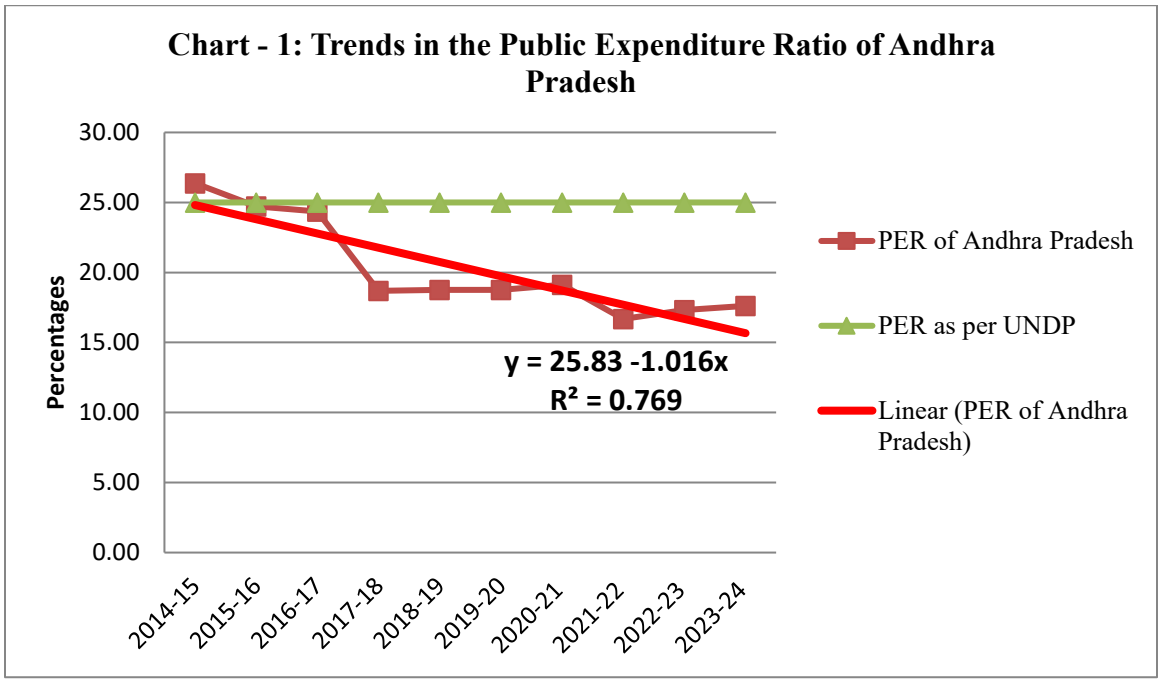
Year	Total public expenditure (Rs crore)	GSDP at current prices (Rs crore)	PER: expenditure as % of GSDP
2014-15	138,450	524,976	26.37
2015-16	149,435	604,229	24.73
2016-17	166,699	684,416	24.36
2017-18	146,944	786,135	18.69
2018-19	163,960	873,721	18.77
2019-20	173,701	925,839	18.76
2020-21	187,102	978,581	19.12
2021-22	191,594	1,148,471	16.68
2022-23	225,842	1,303,524	17.33
2023-24 (RE)	253,557	1,439,674	17.61
Mean, 2014-15 to 2018-19	153,098	694,695	22.58
SD, 2014-15 to 2018-19	11,925	139,199	3.60
CV (%), 2014-15 to 2018-19	7.79	20.04	15.94
Mean, 2019-20 to 2023-24	206,359	1,159,218	17.90
SD, 2019-20 to 2023-24	32,644	216,039	1.02
CV (%), 2019-20 to 2023-24	15.82	18.64	5.67
t-statistic (difference in means)	3.427*	4.042*	−2.800*

Notes: RE = revised estimates; SD = standard deviation (n - 1); CV = coefficient of variation. * Significant at the 5 per cent level (two-tailed, 8 degrees of freedom; critical t = 2.306). The t-statistic is positive when the 2019-20 to 2023-24 mean exceeds the 2014-15 to 2018-19 mean.

Source: Government of Andhra Pradesh, Budget in Brief (various years); Directorate of Economics and Statistics, Andhra Pradesh, Estimates of GSDP (2024); authors' calculations.

The CV is lower in period II (5.67 per cent) than in period I (15.94 per cent), but this reflects the persistence of a low ratio after the step down, not a stronger commitment.

The cause is a large gap between the growth of the economy and the growth of the budget. Between 2014-15 and 2023-24, nominal GSDP grew at a CAGR of 11.9 per cent, but total expenditure grew at only 7.0 per cent. The linear trend in Chart 1 slopes downward at 1.02 percentage points a year (standard error 0.20; R-squared 0.77). At the 2023-24 revised estimates, reaching a PER of 25 per cent would have required about Rs 1.06 lakh crore (Rs 106,362 crore) of additional spending. This is arithmetic, not a recommendation: a larger budget must be financed by own revenues, transfers or borrowing within the limits of fiscal responsibility rules.



4.2 Social Allocation Ratio (SAR)

Table 2 shows that the mean SAR rose from 27.90 per cent in period I to 37.51 per cent in period II, an increase of 9.6 percentage points (t = 4.45, significant). The SAR was below the 40 per cent norm in nine of the ten years and exceeded it only in 2023-24 (42.29 per cent). The trend in Chart 2 is upward at 1.71 points a year (standard error 0.35; R-squared 0.75). The CV fell from 13.68 per cent to 7.85 per cent. The ratio rose sharply in 2017-18, from 25.08 to 34.00 per cent, and again in 2019-20 and 2023-24.

The increase should be interpreted alongside the PER. Expenditure on social services grew at a CAGR of 12.4 per cent, faster than total expenditure (7.0 per cent) and marginally faster than GSDP (11.9 per cent). As a share of GSDP, however, social services expenditure was almost unchanged over the decade: 7.15 per cent in 2014-15 and 7.45 per cent in 2023-24, ranging between 5.4 and 7.5 per cent in between. The rise in the SAR therefore reflects a reallocation within a budget that was shrinking relative to GSDP, together with a smaller denominator, and not a major increase in the economy's resources devoted to social services. The jump in 2017-18 coincides with a fall in total expenditure from Rs 166,699 crore to Rs 146,944 crore; the authors should confirm that the expenditure classification is consistent across the break (see Section 5.2).

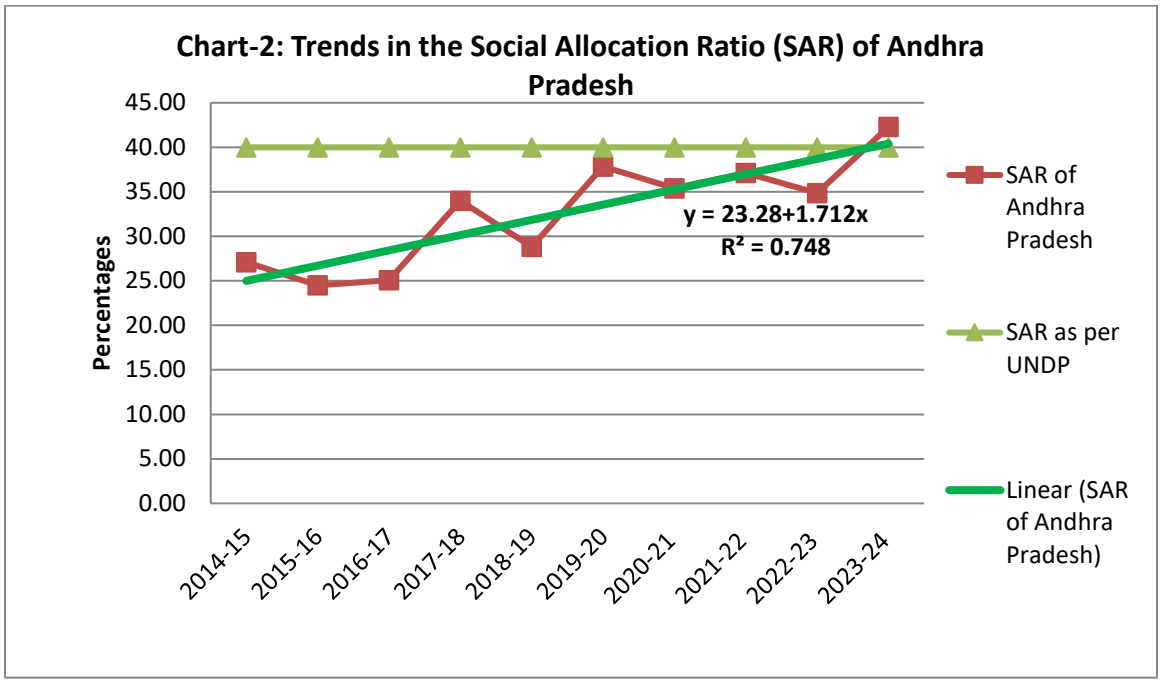
Table 2: Social Allocation Ratio (SAR) of Andhra Pradesh, 2014-15 to 2023-24

Year	Total public expenditure (Rs crore)	Expenditure on social services (Rs crore)	SAR: social services as % of total expenditure
2014-15	138,450	37,527	27.11

Year	**Total public expenditure (Rs crore)**	**Expenditure on social services (Rs crore)**	**SAR: social services as % of total expenditure**
2015-16	149,435	36,599	24.49
2016-17	166,699	41,816	25.08
2017-18	146,944	49,966	34.00
2018-19	163,960	47,258	28.82
2019-20	173,701	65,758	37.86
2020-21	187,102	66,228	35.40
2021-22	191,594	71,146	37.13
2022-23	225,842	78,701	34.85
2023-24 (RE)	253,557	107,240	42.29
Mean, 2014-15 to 2018-19	153,098	42,633	27.90
SD, 2014-15 to 2018-19	11,925	5,880	3.82
CV (%), 2014-15 to 2018-19	7.79	13.79	13.68
Mean, 2019-20 to 2023-24	206,359	77,815	37.51
SD, 2019-20 to 2023-24	32,644	17,253	2.95
CV (%), 2019-20 to 2023-24	15.82	22.17	7.85
t-statistic (difference in means)	3.427*	4.316*	4.454*

Notes: RE = revised estimates; SD = standard deviation (n - 1); CV = coefficient of variation. * Significant at the 5 per cent level (two-tailed, 8 degrees of freedom; critical t = 2.306). The t-statistic is positive when the 2019-20 to 2023-24 mean exceeds the 2014-15 to 2018-19 mean.

Source: Government of Andhra Pradesh, Budget in Brief (various years); Directorate of Economics and Statistics, Andhra Pradesh, Estimates of GSDP (2024); authors' calculations.



4.3 Social Priority Ratio (SPR)

Table 3 shows that the mean SPR fell from 57.42 per cent in period I to 49.24 per cent in period II, a decline of 8.18 points (t = -3.83, significant). The SPR was above the 50 per cent norm in eight of the ten years, up to 2021-22, then fell to 47.83 per cent in 2022-23 and 43.37 per cent in 2023-24. The trend in Chart 3 is downward at 1.64 points a year (standard error 0.24; R-squared 0.86), the steepest and most precisely estimated of the four ratios. The variability of the SPR rose between the sub-periods (CV 5.25 to 7.53 per cent).

Education and health spending (the priority sectors) grew at a CAGR of 8.5 per cent, much slower than the 12.4 per cent for social services as a whole. In 2023-24 social services expenditure rose by 36.3 per cent over 2022-23, but priority-sector expenditure rose by 23.5 per cent. The data therefore show that the expansion of social spending in recent years has gone mainly to non-priority social services, such as welfare, housing, urban development, nutrition and other items. The budget heads used here do not permit a finer attribution, and a sub-head analysis of the 2022-23 and 2023-24 increase is needed to identify the schemes concerned.

Table 3: Social Priority Ratio (SPR) of Andhra Pradesh, 2014-15 to 2023-24

Year	Expenditure on social services (Rs crore)	Expenditure on human priority sectors (Rs crore)	SPR: priority sectors as % of social services
2014-15	37,527	22,386	59.65
2015-16	36,599	22,180	60.60
2016-17	41,816	23,794	56.90
2017-18	49,966	26,405	52.85
2018-19	47,258	26,986	57.10

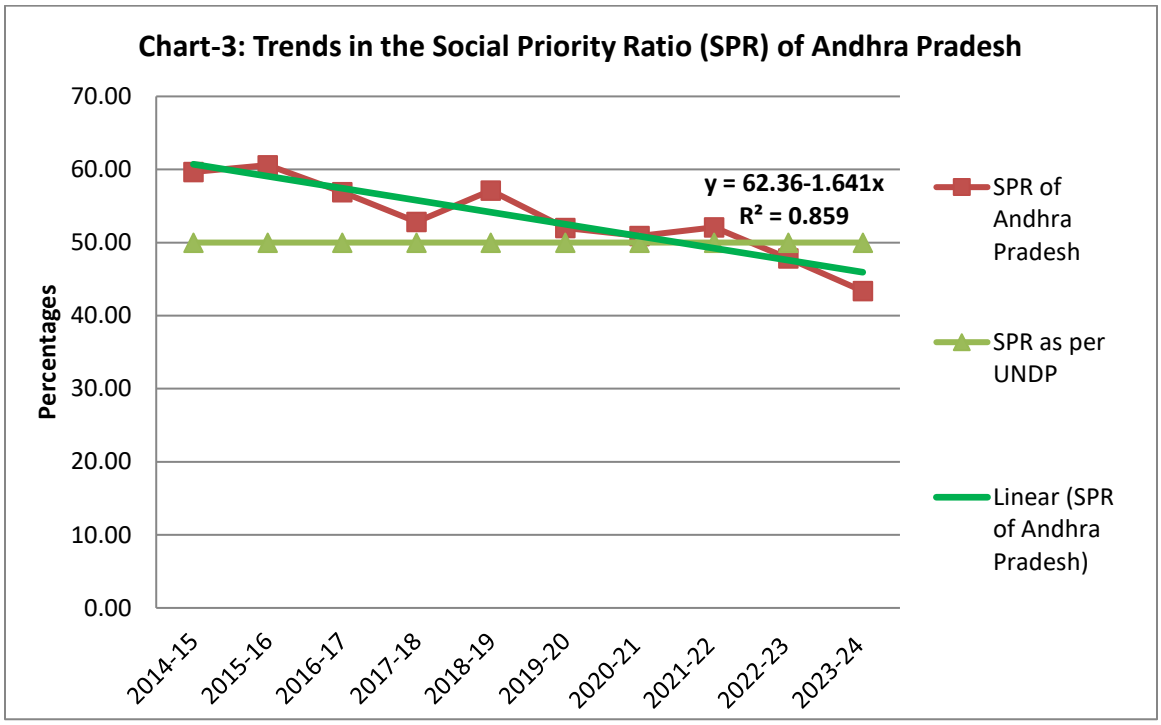
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Year	Expenditure on social services (Rs crore)	Expenditure on human priority sectors (Rs crore)	SPR: priority sectors as % of social services
2019-20	65,758	34,181	51.98
2020-21	66,228	33,716	50.91
2021-22	71,146	37,067	52.10
2022-23	78,701	37,646	47.83
2023-24 (RE)	107,240	46,506	43.37
Mean, 2014-15 to 2018-19	42,633	24,350	57.42
SD, 2014-15 to 2018-19	5,880	2,239	3.02
CV (%), 2014-15 to 2018-19	13.79	9.19	5.25
Mean, 2019-20 to 2023-24	77,815	37,823	49.24
SD, 2019-20 to 2023-24	17,253	5,151	3.71
CV (%), 2019-20 to 2023-24	22.17	13.62	7.53
t-statistic (difference in means)	4.316*	5.364*	−3.829*

Notes: RE = revised estimates; SD = standard deviation (n - 1); CV = coefficient of variation. * Significant at the 5 per cent level (two-tailed, 8 degrees of freedom; critical t = 2.306). The t-statistic is positive when the 2019-20 to 2023-24 mean exceeds the 2014-15 to 2018-19 mean.

Source: Government of Andhra Pradesh, Budget in Brief (various years); Directorate of Economics and Statistics, Andhra Pradesh, Estimates of GSDP (2024); authors' calculations.

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4.4 Human Expenditure Ratio (HER)

Table 4 shows that the mean HER was 3.57 per cent in period I and 3.30 per cent in period II. The HER never reached the 5 per cent norm. Its highest value, 4.26 per cent in 2014-15, was about 85 per cent of the norm, and its lowest, 2.89 per cent in 2022-23, was 58 per cent. The difference between sub-period means (-0.28 points) is not statistically significant (t = -1.16, below the critical value of 2.306). The ten-year trend, however, is significantly negative: -0.092 points a year (standard error 0.031; R-squared 0.53; t of about -3.0). The two results are consistent: the HER dropped early in period I, rebounded in 2019-20 (3.69 per cent) and declined afterwards, so a comparison of two five-year means understates a movement that the trend regression picks up. The sub-period comparison alone would therefore be misleading.

In rupee terms, a HER of 5 per cent in 2023-24 would have required about Rs 25,478 crore more on education and health than the Rs 46,506 crore in the revised estimates, equal to 1.77 per cent of GSDP.

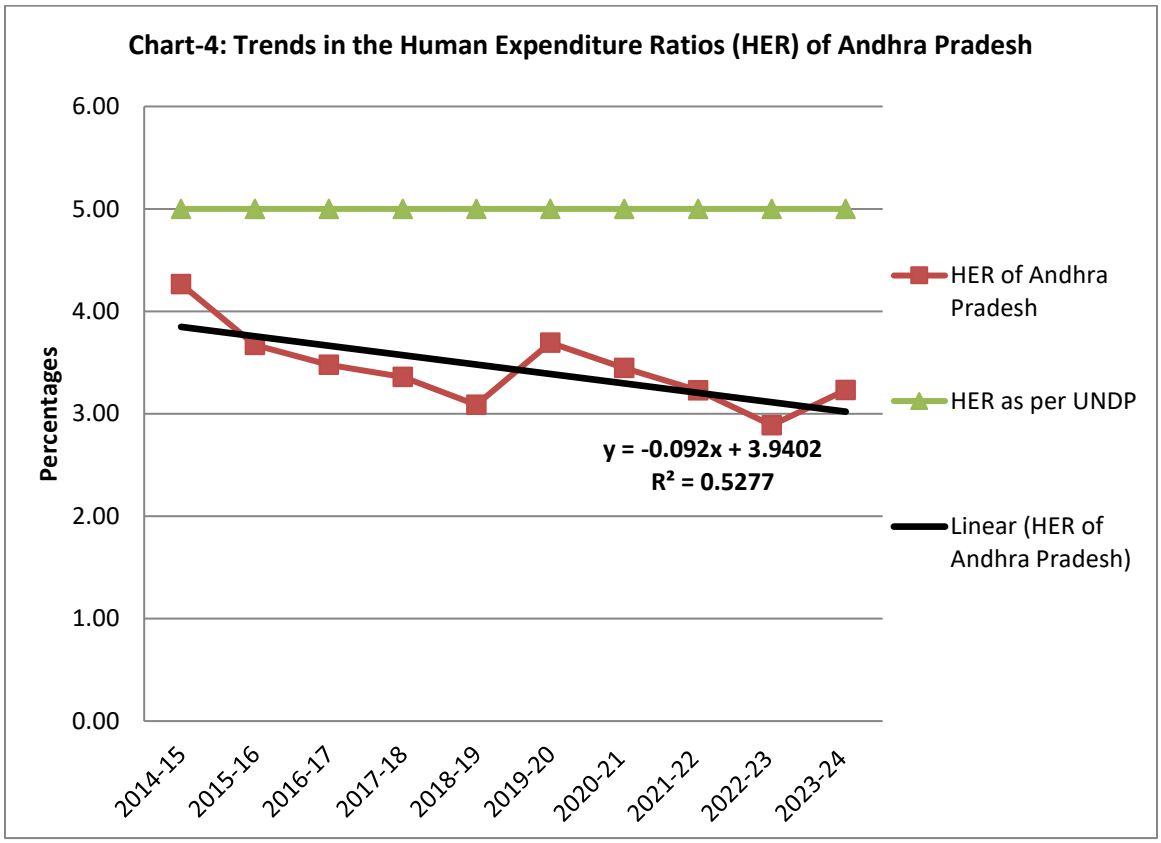
Table 4: Human Expenditure Ratio (HER) of Andhra Pradesh, 2014-15 to 2023-24

Year	Expenditure on human priority sectors (Rs crore)	GSDP at current prices (Rs crore)	HER: priority sectors as % of GSDP
2014-15	22,386	524,976	4.26
2015-16	22,180	604,229	3.67
2016-17	23,794	684,416	3.48
2017-18	26,405	786,135	3.36
2018-19	26,986	873,721	3.09
2019-20	34,181	925,839	3.69

Year	Expenditure on human priority sectors (Rs crore)	GSDP at current prices (Rs crore)	HER: priority sectors as % of GSDP
2020-21	33,716	978,581	3.45
2021-22	37,067	1,148,471	3.23
2022-23	37,646	1,303,524	2.89
2023-24 (RE)	46,506	1,439,674	3.23
Mean, 2014-15 to 2018-19	24,350	694,695	3.57
SD, 2014-15 to 2018-19	2,239	139,199	0.44
CV (%), 2014-15 to 2018-19	9.19	20.04	12.34
Mean, 2019-20 to 2023-24	37,823	1,159,218	3.30
SD, 2019-20 to 2023-24	5,151	216,039	0.30
CV (%), 2019-20 to 2023-24	13.62	18.64	9.03
t-statistic (difference in means)	5.364*	4.042*	−1.157

Notes: RE = revised estimates; SD = standard deviation (n - 1); CV = coefficient of variation. * Significant at the 5 per cent level (two-tailed, 8 degrees of freedom; critical t = 2.306). The t-statistic is positive when the 2019-20 to 2023-24 mean exceeds the 2014-15 to 2018-19 mean.

Source: Government of Andhra Pradesh, Budget in Brief (various years); Directorate of Economics and Statistics, Andhra Pradesh, Estimates of GSDP (2024); authors' calculations.



4.5 Summary and decomposition of the HER

Table 5 summarises the four ratios. Only the SAR moved towards its norm. PER and SPR moved away from theirs, and the HER, as their product, did not improve.

Table 5: Summary of expenditure ratios against UNDP norms

Ratio	Norm (%)	Mean 2014-19	Mean 2019-24	Change (pp)	Years at or above norm	Trend slope, pp a year (SE)	R-sq.	t-statistic
PER	25	22.58	17.90	−4.68	1 of 10	−1.017 (0.197)	0.77	−2.80*
SAR	40	27.90	37.51	9.60	1 of 10	1.713 (0.351)	0.75	4.45*
SPR	50	57.42	49.24	−8.18	8 of 10	−1.642 (0.235)	0.86	−3.83*
HER	5	3.57	3.30	−0.28	0 of 10	−0.092 (0.031)	0.53	−1.16

Notes: pp = percentage points; SE = standard error of the OLS slope on a linear time index (1 to 10). * Significant at the 5 per cent level (two-tailed t-test, 8 degrees of freedom, critical t = 2.306).

Source: Government of Andhra Pradesh, Budget in Brief (various years); Directorate of Economics and Statistics, Andhra Pradesh, Estimates of GSDP (2024); authors' calculations.

Table 6 decomposes the change in HER between 2014-15 and 2023-24 using the identity in Section 2.1. Because HER is the product of PER, SAR and SPR, the change in its natural logarithm is the sum of the changes in the logarithms of the three ratios.

Table 6: Decomposition of the change in HER, 2014-15 to 2023-24

Ratio	2014-15	2023-24 (RE)	Change in natural log
PER	26.37	17.61	−0.404
SAR	27.11	42.29	0.445
SPR	59.65	43.37	−0.319
HER	4.26	3.23	−0.278

Notes: The first three rows add up to the change in HER (the sum is -0.278 apart from rounding). A change in the natural log of -0.278 corresponds to a fall in HER of about 24 per cent.

The HER fell by about 24 per cent. The budget's declining size relative to GSDP lowered it by 0.404 log points and the declining priority share by 0.319, partly offset by the 0.445 contribution of the rising social-services share. Reallocating towards social services was therefore not sufficient. It was outweighed by the fall in the budget-to-GSDP ratio and by the dilution of the priority sectors within social services. Raising the SAR further would help only if the SPR stopped declining and the PER stopped falling.

5. Conclusions

5.1 Main findings and policy implications

Against the UNDP benchmarks, Andhra Pradesh's fiscal commitment to human development in 2014-15 to 2023-24 was below the norm on three of the four ratios and deteriorated on the most important one. The main findings are:

- PER exceeded 25 per cent only in 2014-15 and fell significantly, from a mean of 22.6 per cent to 17.9 per cent, because expenditure grew much more slowly than GSDP.
- SAR rose from 27.9 to 37.5 per cent and crossed the 40 per cent norm only in 2023-24, but this reflects reallocation within a relatively smaller budget, as social services spending remained between 5.4 and 7.5 per cent of GSDP.
- SPR fell from 57.4 to 49.2 per cent and was below the norm in the last two years, because non-priority social services grew faster than education and health.
- HER never reached 5 per cent, averaged 3.6 and 3.3 per cent in the two sub-periods, and has a significant downward trend. Falls in the PER and SPR outweighed the rise in the SAR.

Three policy implications follow. First, the SPR should be treated as a floor within the social-services budget, so that growth in welfare and other social spending does not come at the expense of education and health. Second, because a higher HER requires either a larger budget or a lower dependence on other uses of funds, the State needs a credible plan to raise the PER over time through revenue mobilisation and improved efficiency, rather than relying on borrowing, which is limited by fiscal responsibility norms. Third, budget allocations should be accompanied by monitoring of outcomes, such as enrolment, learning, infant mortality and health infrastructure, so that spending is judged by what it achieves and not only by what it costs.

5.2 Limitations and further research

The analysis has several limitations that future work should address.

- All aggregates are at current prices. The ratios are unaffected by price changes, but the growth rates are nominal, and the analysis does not consider real or per capita spending.
- The figures for 2023-24 are revised estimates and should be updated when audited accounts are available.
- The sharp fall in total expenditure in 2017-18 (from Rs 166,699 crore to Rs 146,944 crore), which accounts for much of the difference between the sub-period PER means, coincides with the introduction of the Goods and Services Tax and should be checked against the treatment of items such as loan repayments, loans and advances, and transfers in the expenditure total; reconciliation with the Reserve Bank of India's *State Finances: A Study of Budgets* is recommended.
- The norms were framed for national governments, and a state's spending is partly financed by Union transfers, including centrally sponsored schemes, so a low PER need not indicate a low State effort.
- The t-tests use only five observations in each group and assume independent observations, although the series are serially correlated. They are indicative, and the trend estimates carry the same caveat.
- The priority-sector definition is broader than the UNDP concept of basic services. Future research could use sub-head data to isolate basic education and primary health care, compare Andhra Pradesh with other states, and link the ratios to outcome indicators.

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