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MEASURING THE BUDGET ELASTICITY OF CLIMATE FINANCE IN NEPAL

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Abstract

Purpose: This study asks whether climate-related public spending in Nepal grew faster or slower than other public spending. The period runs from FY 2010/11 to 2023/24. The study also describes the timing of Climate Budget Tagging (CBT) and the Climate Change Financing Framework (CCFF).

Methodology: The study uses 14 annual observations. The primary model regresses the growth of climate-tagged budget allocations on the growth of non-climate budget allocations in first differences (13 observations). Non-climate allocations equal the total approved budget minus the climate-tagged allocation. This avoids the mechanical overlap between climate and total expenditure. Confidence intervals use 5,000 residual-bootstrap draws. Unit-root evidence is inconclusive, so the model is interpreted as a descriptive growth-on-growth association, not a cointegration or long-run model. ODA, inflation and reform timing are exploratory.

Findings: The estimated growth elasticity is 1.21 (95% bootstrap interval 0.05 to 2.25). The estimate does not differ from 1 ($p = 0.73$) and is sensitive to FY 2013/14. Excluding that year lowers the estimate to 0.65. The climate-tagged allocation averaged 7.2% of the total approved budget. The share rose from 4.3% in 2010/11 to 10.4% in 2014/15 and then fell to 6.2% in 2023/24. The data do not establish a change in relative budget priority.

Significance: The available allocation series provides an imprecise descriptive benchmark. It does not show that climate-tagged allocations gained priority over other allocations, nor does it show that CBT or CCFF caused a change. The figures are not a consistent measure of executed expenditure, and the sample is small.

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1. Introduction

Nepal faces high climate risk. Glaciers in the Hindu Kush Himalaya are changing (Bajracharya et al., 2015). Further mass loss is projected for this century (Rounce et al., 2023). The IPCC (2022) assesses mountain regions of Asia as highly exposed to climate hazards. Nepal's second nationally determined contribution describes the country's share of global emissions as small (Government of Nepal, 2020). The World Bank (2022) country climate and development report assesses the risks climate change poses to Nepal's growth. Public money spent on climate-related activities therefore matters for the country.

This study measures how climate-tagged budget allocations move when non-climate budget allocations grow. An elasticity of one means the climate-tagged share of the approved budget remains broadly stable. An elasticity above one means the share rises as the budget grows. An elasticity below one means the share falls.

This study measures one thing. The study asks how climate spending responds when other public spending grows by one percent. An elasticity of one means climate spending keeps a constant ratio to other spending. An elasticity above one means the climate share rises as the budget grows. An elasticity below one means the share falls.

A direct comparison with total spending is misleading. Climate expenditure sits inside the total budget. The two series are linked by construction. An elasticity above one against the total is therefore hard to read as a sign of priority. This study measures climate expenditure against non-climate expenditure instead. This choice removes the mechanical link.

The study makes three contributions. The study estimates the climate budget elasticity for Nepal against non-climate spending. The study documents the path of the climate share over 14 years. The study reports exploratory evidence on ODA, inflation and the timing of CBT and the CCFF. The design is descriptive. The study does not claim any reform caused a change in spending.

2. Literature Review

2.1. Two views of climate spending in the budget

Two views frame the question. The first treats climate spending as one use of fiscal space among many. López et al. (2011) study how the composition of public spending relates to environmental outcomes. Their work points to the composition of the budget, not only its size.

The second view stresses institutions. Pierson (2000) describes how past choices raise the cost of later reversal. Applied to climate budgeting, this view expects tracked allocations to become harder to cut once they are visible. This expectation is a hypothesis for testing. The literature reviewed here does not confirm the expectation for Nepal.

2.2. Budget elasticity as an analytical tool

A budget elasticity compares the growth of one spending category with the growth of the rest of the budget. A value of one means a stable share. A value above one means a rising share. A value below one means a falling share. The sources used in this study do not report a comparable estimate for climate spending. This study therefore offers no benchmark from other countries.

2.3. Climate Budget Tagging in Nepal and South Asia

Climate Budget Tagging marks and tracks climate-related items in budget documents (UNDP, 2022). The World Bank (2021) reviews international experience with the tool. Nepal developed its budget code in 2012 (NPC, 2012). The first review of the code covered the FY 2013/14 budget (NPC, 2013). Khatun and Al Kabir (2023) review the climate budget in Bangladesh and make recommendations for climate public finance management. Direct evidence on how tagging changes the level of spending is thin.

Regional evidence also shows that tagging systems differ in scope and accounting coverage. UNDP's regional comparison identifies Bangladesh, Nepal, Pakistan, India (Odisha) and the Philippines as using different forms of climate budget tagging, with variation in whether systems cover all sectors or selected sectors and whether they include recurrent as well as investment budgets (UNDP, 2022). OECD's guidance on green budget tagging notes that Bangladesh's citizens' climate budget began reporting both planned allocations and, following public demand for better information, actual expenditure in later reporting (OECD, 2021). This distinction matters for the present study: a tagged allocation is not interchangeable with executed expenditure. These country examples are institutional comparisons, not evidence that tagging itself increases spending.

2.4. ODA and the external financing relationship

Two views describe how external climate finance relates to domestic spending. The additionality view says external funds add to domestic spending. The substitution view says external funds replace some domestic spending. Cordella and Dell'Ariccia (2007) compare budget support and project aid in a theoretical model where donor and recipient preferences differ. Weiler et al. (2018) study what drives the allocation of adaptation aid. Donner et al. (2016) discuss how hard adaptation aid is to measure and track. Climate-marked ODA recorded in the OECD Creditor Reporting System does not always show how much passes through the national budget. This limit applies to the ODA series in this study.

2.5. Spending levels and climate outcomes

Halimanjaya (2015) studies what determines the amount of mitigation finance countries receive. The amount spent and the outcomes achieved are different questions. This study addresses only the first. The study does not test whether more spending improves adaptation or mitigation.

2.6. Fiscal federalism and subnational climate finance

Nepal's 2015 Constitution created three tiers of government. Federal, provincial and local governments share expenditure responsibilities. Intergovernmental transfers connect the tiers (Shah, 2016). The Intergovernmental Fiscal Arrangement Act sets rules for revenue sharing and transfers (Government of Nepal, 2017). Boadway and Shah (2009) set out the general principles of multi-order fiscal systems. National budget data in this study cover the federal budget. The study does not observe climate spending by provincial and local governments. National figures might therefore understate total public climate spending.

Recent assessments underline that Nepal's fiscal federalism remains a work in progress. The Asian Development Bank reviews the assignment of expenditure responsibilities, revenue mobilisation and intergovernmental transfers during the transition to federalism (ADB, 2022). The World Bank's Nepal Fiscal Federalism Update documents continuing gaps in expenditure assignment, transfer design, budget execution and subnational public financial management (World Bank, 2024). Acharya and Bhusal (2024) also find that intergovernmental transfers are important for local accountability, while centralisation, limited administrative capacity and weak political commitment constrain their effectiveness. These studies support the need to extend climate-budget reporting below the federal level, but they do not provide a subnational climate-allocation series for the period examined here.

3. Methodology

3.1. Conceptual framework

The government splits the total budget (TB) between climate expenditure (CE) and non-climate expenditure (NCE):

$TB_t = CE_t + NCE_t$ (1)

The parameter of interest is the elasticity of CE with respect to NCE.

3.2. Data

The study covers 14 fiscal years from 2010/11 to 2023/24. Appendix A lists every annual value used. Climate expenditure (CE) is operationalised here as the climate-tagged budget allocation reported in the national Climate Budget Tagging (CBT) records and related budget documents. It includes items classified as Highly Relevant and Relevant. The total budget (TB) comes from Ministry of Finance annual budget documents. Climate-marked ODA comes from the OECD Creditor Reporting System (OECD, 2023). Inflation is the annual change in the Consumer Price Index from Nepal Rastra Bank (2023).

Three data notes apply. First, all 14 values are reported figures; no value is predicted or interpolated. Second, TB is the annual approved budget. The CE series is treated as climate-tagged budget allocations, not executed expenditure. For FY 2013/14, the CE value is NPR 53.5

billion, matching the amount reported in the National Planning Commission's CBT application review (NPC, 2013). The review reports 10.3% of the total budget. Third, the annual source records do not consistently distinguish approved allocations from revised allocations or outturns, and the underlying year-by-year source extracts are not reproduced in the present dataset. This limits independent verification of the series. The results must therefore be interpreted as patterns in the reported tagged allocation series, not actual public spending. Tagging coverage also changed over time, which affects comparisons across years.

3.3. Variables, prices and deflation

Climate-tagged budget allocations (CE), non-climate budget allocations (NCE), the total budget (TB) and ODA are measured in billions of Nepali rupees at current prices. The series are nominal. NCE equals TB minus CE. Inflation is a rate and is used in percentage points. Continuous money variables enter in natural logarithms. Because CE is a tagged allocation measure, the paper uses 'climate budget allocation' when discussing the observed series and reserves 'climate expenditure' for executed spending, which is not measured consistently here.

Deflation is handled as a sensitivity check. The study builds a price index from the annual CPI inflation rates in Appendix A. The index equals 100 in FY 2010/11 and chains forward with each year's inflation rate. Section 4.5 repeats the primary model with CE and NCE deflated by this index. The share of CE in TB is unit-free and needs no deflation. Since the CPI series and budget series are annual, this adjustment is approximate and does not change the allocation-versus-outturn limitation.

Two timing indicators are considered. DCBT equals 1 from FY 2011/12 and 0 before, reflecting the introduction of CBT in the budget process. DCCFF is defined using FY 2017/18 onward because the CCFF was endorsed in December 2017 (UNDP, 2018). The earlier FY 2015/16 cutoff is retained only as an alternative exploratory breakpoint and is not described as the date the CCFF began. DCBT equals 1 in 13 of 14 years and is constant in every first-difference observation. The study cannot estimate a CBT effect from these data.

3.4. Primary specification

The primary model uses growth rates. The model regresses the change in ln CE on the change in ln NCE for 13 observations:

$$\Delta \ln CE_t = \alpha + \beta \, \Delta \ln NCE_t + u_t \qquad (2)$$

The unit-root tests in Section 4.2 do not provide a reliable common integration-order classification. With only 14 observations, the ADF and KPSS tests have low power and are sensitive to the deterministic terms included. The primary model is therefore presented as a descriptive regression of annual growth rates, not as a solution justified by a claim that both level series are I(1). The study makes no claim about a long-run relationship. It does not use the

ARDL bounds procedure, an error-correction model, FMOLS or DOLS. These methods would require stronger evidence on integration and cointegration than this sample provides.

A static levels regression is a descriptive companion only:

$$\ln CE_t = \alpha + \beta \ln NCE_t + e_t \quad (3)$$

Static regressions in small samples carry bias (Banerjee et al., 1986). The study does not read Equation 3 as a long-run equilibrium.

3.5. Unit root and cointegration tests

Augmented Dickey-Fuller (ADF) tests are reported with an intercept and with an intercept plus linear trend. The maximum lag is 1 because the sample contains only 14 annual observations; the Akaike information criterion selects between 0 and 1 lag. KPSS tests use two lags and the null of stationarity. The results are treated as sensitivity evidence, not as a definitive classification of integration order. In particular, an ADF rejection under one deterministic specification and non-rejection under another is not resolved by selecting whichever result supports a preferred model. The Zivot-Andrew's break test was attempted, but the trend version did not compute and the intercept version was degenerate for CE. No break-test conclusion is drawn. Because the integration-order evidence is inconclusive, the Engle-Granger residual test is not used to establish or reject cointegration and no ECM is estimated.

3.6. Inference and bootstrap design

Tables report ordinary least squares standard errors. The primary model also reports HC3 standard errors. Bootstrap inference uses a residual bootstrap. Step one fits the model and saves the residuals. Step two draw residuals with replacement. Step three rebuilds the dependent variable from fitted values plus drawn residuals. Step four re-estimates the model. The study repeats the four steps 5,000 times with a fixed seed (20261120). Regressors stay fixed. The 95% interval uses the 2.5th and 97.5th percentiles. The bootstrap does not correct small-sample bias or serial dependence.

Five diagnostics apply to the primary model: Breusch-Godfrey with one lag, Durbin-Watson, Breusch-Pagan, Jarque-Bera and Ramsey RESET. The text reports exact p-values and no stars. Given the small sample, diagnostic p-values are treated as descriptive checks rather than decisive pass/fail tests. The study does not label results with p-values between 0.05 and 0.10 as statistically significant or as evidence of a substantive effect.

3.7. Exploratory analyses and sensitivity checks

Three exploratory analyses follow. The first adds ODA growth and the change in inflation to the primary model. The second adds an interaction between NCE growth and the CCFF dummy. The third compares the climate share before and after the CCFF dates. These models have 13 observations and up to four parameters. The study reports them as description only.

Sensitivity checks include leave-one-out estimates, deflated series and total budget in place of NCE. The last check shows the size of the mechanical overlap.

4. Results

4.1. Descriptive statistics

Table 1. Descriptive statistics, FY 2010/11 to 2023/24 (N = 14)

Variable	Mean	Std. dev.	Min	Max
Climate-tagged allocation (NPR bn)	74.8	35.1	12.1	110.1
TB (NPR billion)	1,056.3	553.6	281.5	1,793.8
NCE (NPR billion)	981.5	520.5	269.4	1,683.7
ODA (NPR billion)	72.7	20.5	35.2	95.7
INF (%)	6.9	2.3	3.6	9.9
CE/TB (%)	7.2	1.8	4.3	10.4

Source: Author's calculations from Appendix A. Values are nominal.

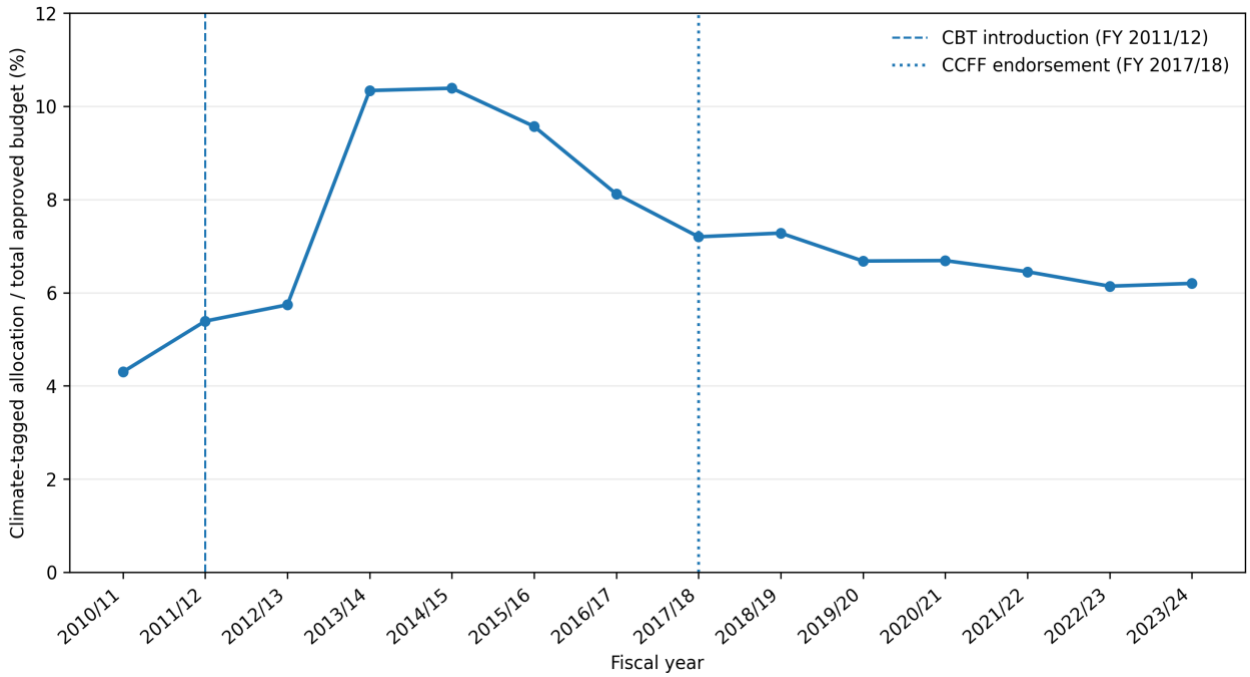
Table 1 presents the descriptive statistics for the main variables used in the study over 14 fiscal years, from 2010/11 to 2023/24. The average climate-tagged budget allocation was NPR 74.8 billion, with a standard deviation of NPR 35.1 billion. It ranged from NPR 12.1 billion to NPR 110.1 billion, showing considerable variation in climate-related budget allocations over the study period.

The total budget (TB) averaged NPR 1,056.3 billion, while non-climate expenditure (NCE) averaged NPR 981.5 billion. Official Development Assistance (ODA) averaged NPR 72.7 billion. Average inflation was 6.9%, with values ranging from 3.6% to 9.9%.

The final indicator, CE/TB, shows that climate-tagged allocations accounted for an average of 7.2% of the total budget. However, this share varied across the years, ranging from 4.3% to 10.4%.

Overall, the descriptive statistics show that climate-tagged allocations increased and varied over the study period, while their share of the total budget also fluctuated. These figures provide an overview of the data used in the analysis but do not, by themselves, establish a relationship between climate allocations and total government spending.

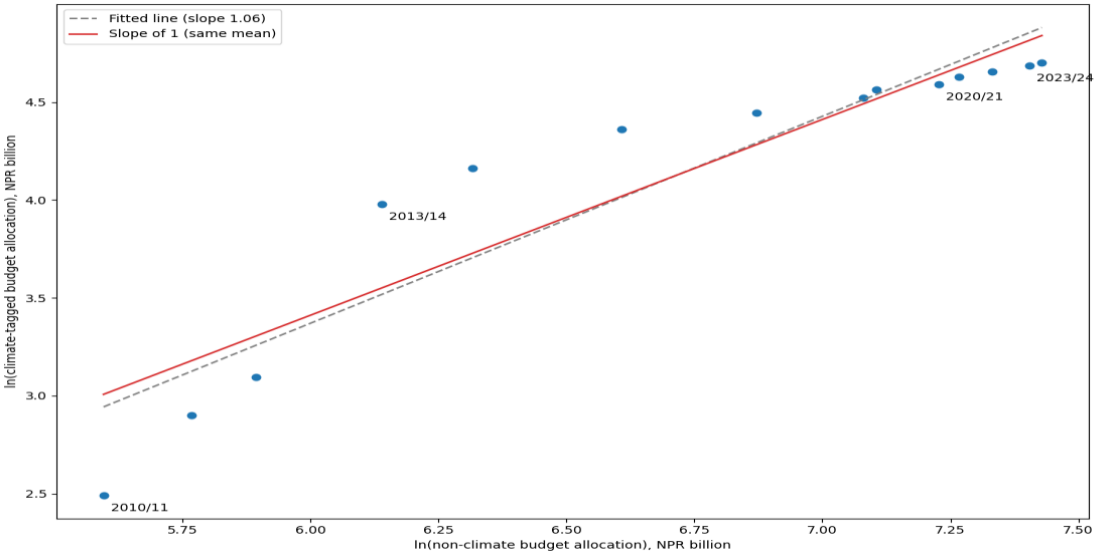
Figure 1. Climate-tagged budget allocation as a share of the total approved budget, FY 2010/11 to 2023/24



Source: Author's calculations from Appendix A. The vertical markers indicate CBT introduction (FY 2011/12) and CCFF endorsement (December 2017; FY 2017/18).

The figure shows that climate-tagged budget allocation increased from around 4.3% in 2010/11 to a peak of approximately 10.4% in 2014/15. However, the share gradually declined after 2015/16, reaching around 6.2% in 2023/24. Although the introduction of Climate Budget Tagging (CBT) in 2011/12 and the endorsement of the Climate Change Financing Framework (CCFF) in 2017/18 strengthened the institutional framework, these developments were not followed by a sustained increase in the climate budget share.

Figure 2. Climate-tagged and non-climate budget allocations in logarithms



Source: Author's calculations from Appendix A. The horizontal axis shows ln(non-climate budget allocation); the vertical axis shows ln(climate-tagged budget allocation).

The figure shows a strong positive relationship between non-climate and climate budget allocations. The fitted regression line has a slope of 1.06, slightly higher than the reference slope of 1. This suggests that climate budget allocation generally increased alongside non-climate budget allocation. However, the relationship alone does not establish that increases in the overall budget caused higher climate spending. It mainly indicates that climate-related allocations have grown alongside the broader government budget.

Table 2. Unit root tests (p-values, ADF lag in parentheses; KPSS statistics)

Series	**ADF level, intercept**	**ADF level, trend**	**ADF diff., intercept**	**ADF diff., trend**	**KPSS level, intercept**	**KPSS level, trend**
ln CE	0.005 (0)	0.813 (0)	0.725 (1)	0.008 (0)	0.485	0.153
ln NCE	0.122 (0)	0.995 (0)	0.860 (1)	0.106 (0)	0.547	0.151
ln ODA	0.000 (0)	0.933 (1)	0.837 (1)	0.003 (0)	0.540	0.165
INF	0.188 (0)	0.226 (0)	0.000 (0)	0.018 (1)	0.386	0.122
ln (CE/TB)	0.170 (0)	0.428 (0)	0.063 (0)	0.147 (0)	0.127	0.128

Source: Author's calculations. ADF lag selection uses AIC with a maximum lag of 1. KPSS uses two lags. KPSS 5% critical values are 0.463 (intercept) and 0.146 (trend). N = 14; results are sensitive to deterministic terms and have low power.

The tests give a mixed picture and do not support a firm integration-order classification. For ln CE, the ADF test with an intercept rejects a unit root (p = 0.005), while the version with a trend

does not (p = 0.813). The KPSS test rejects level stationarity under both deterministic specifications at the reported 5% critical values. For ln NCE, the ADF test does not reject a unit root under either specification, while the KPSS statistics also point away from level stationarity. However, first-difference results are not uniformly decisive across tests and deterministic specifications. With N = 14, these tests have low power and are sensitive to specification. The paper therefore treats the integration evidence as inconclusive and does not classify all series as I(1). The first-difference regression is retained as a descriptive growth-on-growth association, not as an inference based on a confirmed I(1) process.

4.3. Long-run relationship

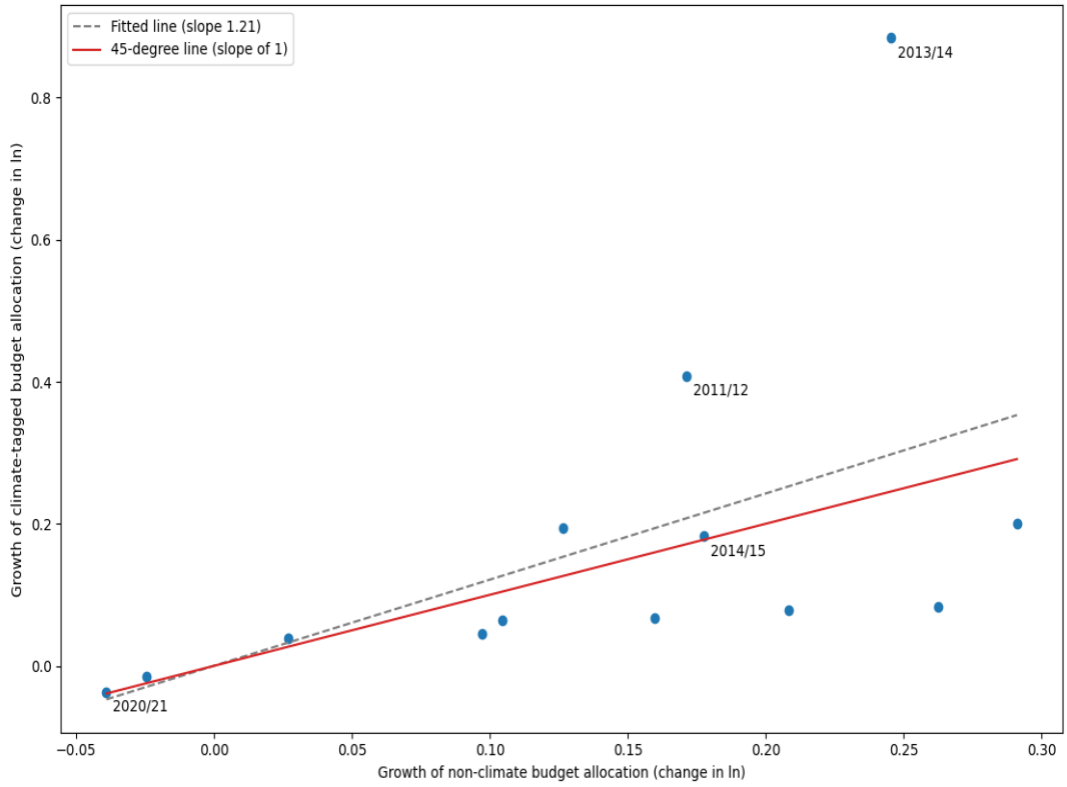
No long-run relationship is estimated or claimed. The Engle-Granger test is not used as a basis for inference because the integration-order evidence is inconclusive and the sample is too small to support a reliable cointegration assessment. The earlier residual-test statistics are therefore not interpreted as evidence for or against cointegration. No error-correction term or long-run elasticity is reported.

Table 3. Primary model: growth of climate-tagged budget allocation on growth of non-climate budget allocation (N = 13)

Variable	**Coeff.**	**OLS SE**	**HC3 SE**	**Bootstrap SE**	**p-value**	**95% bootstrap CI**
Δln NCE (θ)	1.213	0.601	0.684	0.547	0.069	[0.05, 2.25]
Constant	0.000	0.103	0.039	0.094	0.999	[-0.14, 0.22]
R^2	0.270					

Source: Author's calculations. Dependent variable: Δln CE. Test of θ = 1: p = 0.730. No stars are used. CE refers to climate-tagged budget allocations.

Figure 3. Growth in climate-tagged and non-climate budget allocations (changes in logarithms)



Source: Author's calculations from Appendix A.

The estimated growth elasticity is 1.21, but it is imprecise. Its 95% residual-bootstrap interval ranges from 0.05 to 2.25 and includes 1. The test of $\theta = 1$ gives $p = 0.73$. The point estimate alone does not establish that climate-tagged allocations grew faster than non-climate allocations. The estimate is also sensitive to FY 2013/14: excluding that observation reduces it to 0.65. Given the small sample, wide interval and influential observation, the result should be read as a descriptive benchmark rather than evidence of a distinct spending priority.

Table 4. Diagnostics for the primary model

Test	**Statistic**	**p-value**
Breusch-Godfrey (1 lag)	0.435	0.509
Durbin-Watson	1.561	n/a
Breusch-Pagan	2.411	0.120
Jarque-Bera	11.482	0.003
Ramsey RESET (F)	0.006	0.941

Source: Author's calculations. Five diagnostic checks are reported.

The Jarque-Bera test rejects normality ($p = 0.003$). FY 2013/14 has a large residual and is influential in the primary estimate. The other diagnostics do not reject their respective nulls at the

5% level, but with only 13 observations they have limited power. The bootstrap interval does not remove the influence of this observation or correct possible serial dependence.

Table 5. Descriptive levels regression: ln CE on ln NCE (N = 14)

Variable	Coeff.	OLS SE	Bootstrap SE	95% bootstrap CI
ln NCE (b)	1.057	0.118	0.108	[0.84, 1.26]
Constant	-2.973	0.798	0.726	[-4.33, -1.51]
R^2	0.869			

Source: Author's calculations. Test of b = 1: p = 0.638. Durbin-Watson 0.57. Breusch-Godfrey p = 0.023. RESET p < 0.001.

The levels regression is shown only as a descriptive association. Its residuals are strongly autocorrelated and the RESET test rejects the functional form. Given the inconclusive integration tests, this regression cannot be interpreted as a long-run elasticity or equilibrium relationship.

4.5. Sensitivity checks

Table 6. Sensitivity of the growth elasticity

Specification	Estimate	SE	95% bootstrap CI
Primary: Δln NCE	1.213	0.601	[0.05, 2.25]
Excluding FY 2013/14 (N = 12)	0.647	0.306	Not computed
Deflated series (CPI index built from Appendix A)	1.038	0.652	[-0.22, 2.23]
Total budget in place of NCE	1.462	0.528	[0.46, 2.44]

Source: Author's calculations. Leave-one-out estimates for the other 12 years range from 1.16 to 1.49.

The estimate changes materially when FY 2013/14 is removed: it falls from 1.21 to 0.65. The other leave-one-out estimates range from 1.16 to 1.49. Deflating both series gives 1.04. Using total budget rather than non-climate allocations gives 1.46. This comparison illustrates why the non-climate specification is preferred, although the sensitivity results remain imprecise and should not be treated as formal tests of priority.

4.6. Exploratory results

Table 7. Exploratory model with ODA and inflation (N = 13)

Variable	Coeff.	OLS SE	Bootstrap SE	p-value	95% bootstrap CI
Δln NCE	0.078	0.756	0.636	0.920	[-1.18, 1.41]
Δln ODA	2.762	1.282	1.087	0.060	[0.79, 5.42]
ΔINF	-0.012	0.024	0.020	0.629	[-0.06, 0.03]

R^2	0.519				

Source: Author's calculations. Exploratory. VIFs are at most 2.0 in differences. In levels, VIFs reach 37 for ln NCE and 34 for ln ODA.

In the exploratory model, ODA growth is associated with climate-allocation growth, but the estimate is imprecise and the small sample cannot distinguish additionality from substitution. Some climate-marked ODA flows may bypass the national budget. The result does not show that ODA causes higher climate allocations.

Table 8. Exploratory interaction using alternative post-2015/16 and post-2017/18 cutoffs

Variable	**CCFF from 2015/16**	**CCFF from 2017/18**
Δln NCE (pre-cutoff)	2.684 (SE 0.465)	1.356 (SE 0.594)
Δln NCE × CCFF	-2.044 (SE 0.429)	-1.047 (SE 0.813)
Implied slope after CCFF	0.640	0.309
Years before CCFF in sample	4	6

Source: Author's calculations. Exploratory. The interaction p-values are 0.001 and 0.227. The pre-CCFF slope depends on FY 2013/14.

The interaction estimates are exploratory and highly sensitive to the cutoff date and FY 2013/14. The FY 2015/16 cutoff is an alternative breakpoint, not the date of CCFF endorsement. The FY 2017/18 cutoff better matches the December 2017 endorsement. With only a few pre-cutoff observations, these estimates do not establish a change in the relationship after the CCFF.

The share comparison gives the same message. The mean share was 7.2% in 2010/11 to 2014/15 and 7.1% from 2015/16. With a 2017/18 start the means are 7.7% and 6.7%. A regression of the share on DCCFF gives a coefficient of -0.08 percentage points ($p = 0.94$). Excluding 2010/11 the coefficient is -0.82 points ($p = 0.45$). A 2017/18 start gives -1.03 points ($p = 0.31$). The data show no rise in the climate share after the CCFF dates.

In 2020/21, the reported climate-tagged allocation fell 3.6% and non-climate allocations fell 3.8%; the share remained at 6.7%. In 2023/24, the climate-tagged allocation fell 1.5% and non-climate allocations fell 2.4%. These are changes in budget allocations, not verified changes in cash expenditure.

5. Discussion

5.1. The central finding

The primary estimate is 1.21, but its confidence interval is wide and includes 1. The estimate is sensitive to FY 2013/14: without that year it falls to 0.65. The data do not establish that climate-tagged budget allocations gained priority over other allocations. They do not establish the opposite either. The safest reading is that the available annual series provides an imprecise descriptive benchmark.

The share path adds context. The share ended at 6.2%, above its 2010/11 level of 4.3%. The share stayed below its 2013/14 to 2015/16 peak. Most of the gain came in the early years. The sources used here give no verified benchmark from other countries. The study makes no cross-country comparison.

5.2. ODA

The exploratory ODA result is not strong enough to distinguish additionality from substitution or to support a causal interpretation. Some climate-marked ODA may not pass through the national budget, which further limits comparison with the domestic allocation series.

5.3. Reform timing

The data show no clear rise in the climate share after the CCFF endorsement period. The CBT effect cannot be assessed because only one year precedes the CBT indicator. The increase in FY 2013/14 coincides with the first full application review of the budget code (NPC, 2013), but may partly reflect wider tagging coverage. The study does not attribute any observed change to either reform.

5.4. Behaviour in budget downturns

The two observed downturn episodes show the reported climate-tagged allocation moving alongside non-climate allocations. Two observations are not enough to establish whether climate-related allocations are more or less protected during fiscal contractions.

5.5. Limits

Six limits apply. First, the sample has only 13 growth observations. Second, FY 2013/14 strongly influences the estimate. Third, the CE series is a tagged budget-allocation measure, not a consistent series of actual outturns; the annual source extracts and accounting basis need to be verified against the original budget records. Fourth, tagging coverage changed over time. Fifth, the data exclude provincial and local climate-related allocations. Sixth, the design has no causal identification. The unit-root evidence is inconclusive, so no long-run relationship is claimed. Longer, consistently defined allocation and outturn series, together with subnational data, would improve future work.

6. Conclusions

This study estimates the association between growth in climate-tagged budget allocations and growth in non-climate budget allocations in Nepal. The point estimate is 1.21, with a 95% bootstrap interval of 0.05 to 2.25. The estimate does not differ statistically from 1 and is sensitive to FY 2013/14. Climate-tagged allocations averaged 7.2% of the total budget and stood at 6.2% in 2023/24. The integration tests are inconclusive, and the study makes no claim about a long-run

equilibrium. The results are descriptive and do not show that CBT or CCFF caused changes in allocations.

7. Policy Recommendations

The recommendations follow from what the study measured.

- Report the climate-tagged share of the approved budget each year alongside the nominal amount. This provides a transparent measure of the allocation's share, while making clear that it is not the same as executed expenditure.
- Publish the annual climate-tagged series with a clear accounting basis. For each year, identify whether the figure is an original allocation, revised allocation or actual outturn, and publish the underlying source table and tagging coverage. This would allow researchers to separate changes in budget priorities from changes in classification or execution.
- Extend comparable climate-budget reporting to provincial and local governments. The present federal series does not cover their own-source budgets and spending, even though expenditure responsibilities are shared across levels of government.

Three ideas lie outside the empirical scope of this study. The study has no data on loans versus grants, budget execution rates or outcomes. The ideas are an expenditure floor for climate spending, a climate-resilience fund and a shift from loans to grants. The study neither supports nor rejects them. Future work with the right data should test them.

Appendix A. Data used in the study

Table 1. Annual data (NPR billion, current prices)

FY	TB	CE	NCE	CE/TB %	ODA	INF %	CPI index	DCBT	DCCFF
2010/11	281.5	12.1	269.4	4.30	35.2	9.6	100.0	0	0
2011/12	337.9	18.2	319.7	5.39	42.5	8.3	108.3	1	0
2012/13	384.9	22.1	362.8	5.74	48.1	9.9	119.0	1	0
2013/14	517.2	53.5	463.7	10.34	55.4	9.1	129.9	1	0
2014/15	618.1	64.2	553.9	10.39	62.8	7.2	139.2	1	0
2015/16	819.5	78.4	741.1	9.57	71.3	9.9	153.0	1	0
2016/17	1,048.9	85.2	963.7	8.12	76.2	4.5	159.9	1	0
2017/18	1,279.0	92.1	1,186.9	7.20	80.5	4.1	166.4	1	1
2018/19	1,315.2	95.8	1,219.4	7.28	85.1	4.6	174.1	1	1
2019/20	1,533.0	102.4	1,430.6	6.68	90.4	6.2	184.9	1	1
2020/21	1,474.6	98.7	1,375.9	6.69	88.2	3.6	191.5	1	1
2021/22	1,632.8	105.3	1,527.5	6.45	92.6	6.3	203.6	1	1

2022/23	1,793.8	110.1	1,683.7	6.14	95.7	7.8	219.5	1	1
2023/24	1,751.3	108.5	1,642.8	6.20	94.1	5.4	231.3	1	1

Source: TB from Ministry of Finance annual budget documents. CE is the reported climate-tagged allocation compiled from national CBT records and related budget documents; the present file does not contain a separate year-by-year source citation or source extract for each CE observation. ODA from the OECD Creditor Reporting System. INF from Nepal Rastra Bank. NCE = TB - CE. The CPI index equals 100 in 2010/11 and is chained from the annual inflation rates in the INF column. CE/TB is a share of approved budget allocations.

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