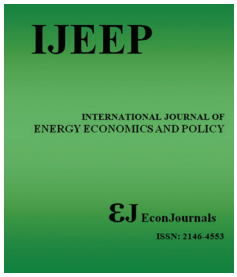


International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2025, 15(6), 840-846.

# Examining Ecological Footprints in the backdrop of Institutional Quality, Economic Growth, FDI and Urbanisation

**J. C. Sharmiladevi**

Symbiosis Centre for Management Studies, Symbiosis International (Deemed University), Pune, Maharashtra, India.
Email: sharmiladevi@scmspune.ac.in

**Received:** 16 June 2025 **Accepted:** 05 October 2025 **DOI:** https://doi.org/10.32479/ijeep.21470

**ABSTRACT**

The objective of this study is to identify the impact of economic growth, international trade, cross-border capital movement, institutional quality and urbanisation upon the ecological footprints for the case of India for the period from 2000 to 2024. After checking the data for unit roots and ensuring data stability, the ARDL model was calculated, with bounds test and error correction. The model is able to explain 66.8% of the total changes, bounds test results indicate long-term equilibrium relations among the variables. Error correction term satisfies stability, showing a negative and significant coefficient score of −1.20 rate of returning to equilibrium. Stability and diagnostic tests, recursive estimates indicate significant results. Impulse response function results show an asymmetrical relation with all the dependent variables. Inclusion of institutional quality adds uniqueness to this study, and this paper bridges the gap in identifying the role of institutional factors in impacting ecology considering economic factors and environmental challenges.

**Keywords:** Ecological Footprints, Institutional Quality, Urbanisation, Foreign Direct Investment, Economic Growth, Autoregressive Distributed Lag
**JEL Classifications:** F14, F23

## 1. INTRODUCTION

Climate change is becoming an important challenge to humanity. Nations across different state of development are not immune to such changes (Zhang et al., 2023; Danish and Ulucak, 2020), Achieving sustainable development is the pressing need, and every nation is trying to achieve this goal by managing economic growth on the one hand and ecological balance on the other hand, as this two are precisely entangled (Van Tulder et al., 2021; Ali et al., 2024; De Neve and Sachs, 2020). Attainment of environmental sustainability is significant as it plays a critical role in all dimensions of development. Creating economic development is the need and responsibility of every nation. International business development and trade act as a catalyst for enhancing economic development.

With globalisation, the flow of foreign investments across borders has opened the corridors of trade-related economic development (Cil, 2023). Developing countries, due to their inherent qualities, started giving importance to sustainable development only recently, as the most pressing needs like poverty alleviation, employment generation, and inflation control were their main targets during the initial stages of development after attaining independence. Even though they have come a long way in crossing the basic needs, the realisation of the fact that economic development and ecological balance can be synergistically attained with a better regulatory and governance framework has emerged recently (Güngör et al., 2021).

Against this backdrop, this study investigates the outcomes of economic growth, international trade, cross-border capital movement, urbanisation and institutional quality upon the ecological footprints for the case of India for the time period 2000-2024. India is one of the fastest-growing economies in the Asian region, achieving 6-7% of economic growth measured through gross domestic product (GDP), with 55% of rural to

urban migration in 2023-2024, and 40% of the total population is expected to live in urban areas by 2030 (MOSPI, 2024)

Ecological footprints indicate the environmental quality assessment of land, water, all emissions and forest resources. It also provides significant insights into human consumption of natural resources, which makes it a novel indicator for assessing environmental quality. People use more resources than they regenerate, which results in ecological deficiency. The per capita ecological footprints and biocapacity of 2.77 and 1.58 global hectares urge the need for humanity to demand 75% more from the earth than its ecosystem can produce (Global Footprints Network, 2025)

## 2. REVIEW OF LITERATURE

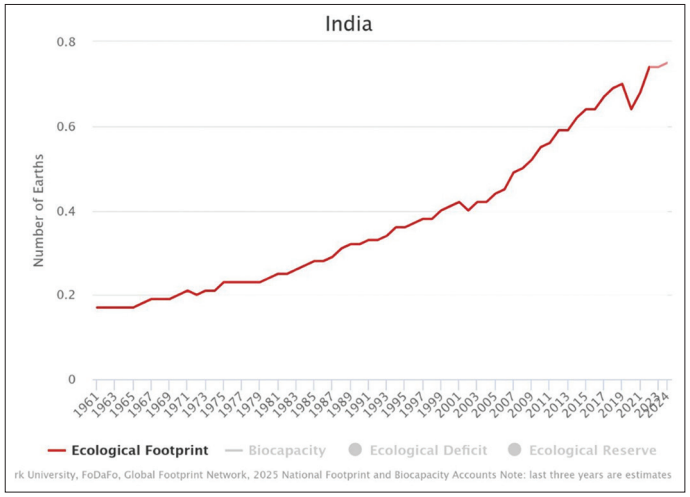
Environment and Economic Growth: There exist an inverse relationship between economic growth and environment, as in the initial stages of development of a national, resources are used for the attainment of industrial and urban development surpassing the environmental goals to the back seat (Grossman and Krueger, 1991), and this will continue until the economy reaches a threshold level of development. So economic development has both positive and negative sides on the environment (Dinda, 2004). Multiple studies confirm that India is getting economic growth advantage at the cost of the environment, as most of the developmental activities are causing more carbon emissions (Rana and Sharma, 2019; Ozturk et al, 2024; Holtbrügge and Raghavan, 2025). Recent studies also identified that India is creating development in a more cautious and environmental friendly manner Gogoi and Hussain (2024).

Environment and Institutional Quality: Institutional quality favourably influences environmental quality improvement and helps to reduce ecological footprints (Uzar, 2021) through better allocation of resources (Wong et al., 2012; Ebeke and Etoundi, 2017). But studies conducted by Le and Ozturk, 2020, in 47 emerging markets and developing countries identified that institutional quality if positively influencing carbon emission

Environment and Openness: Openness to trade is considered one of the major and positive outcomes of globalisation, which can enhance the trade relationship of nations unrestricted (Murthy and Gambhir, 2017). But at the same time, the same authors also indicate that openness is also one of the factors that creates more pollution by examining the pollution haven hypothesis for India (Murthy and Gambhir, 2018).

Environment and FDI: The literature indicates that inward FDI brings multiple gains in the economic anatomy of nations (Lucas, 1988; Romer, 1990), as it can bring clean technology that can help environmental management (Dörrenbächer et al., 2024). Few studies also caution the fact that the combined outcomes of inward FDI needs to be assessed by comparing and understanding the overall outcomes of environment and FDI (Krugman, 2000; Eskeland and Harrison, 2003; Zhang and Zhou, 2016; Fetscherin et al, 2010; Klier et al., 2017; Paul and Benito, 2018), as the implementation and realisation of such advantages depends upon right policy adoption by host economies (Clunies-Ross et al., 2009).

**Figure 1:** Ecological footprints of India




Environment and Urbanisation: Movement of people towards urban cities enhances the pressure on cities and urban settlements, infrastructure and resources that can cause more pollution and environmental challenges (Azam et al., 2022). Increasing human activities with industrial and service sector developments in urban cities negatively pressurise the urban environment (Hatmanu et al., 2022), but few studies contradict the above by indicating that the urban population is more environmentally conscious and thereby reduces pollution.

The aim of this research is to investigate the impact of globalisation induced outcomes resulting in economic growth, cross-border trade and capital movement and migration into urban areas upon the environment, considering India, as it is a fast-growing economy with year on year GDP growth of 6% on average in year 2024 and is expected to becoming the third largest economy in the world. Parallelly, India is also one of the highest polluting economies by emitting 2.13 tons of Carbon dioxide ($CO_2$) per capita ($CO_2$ Emissions per capita, 2024), which raises concerns towards environmental quality and sustainability. At the same time, the initiatives of the government towards maintaining the environment are also on the rise, as a result of which India can be a better choice to study the overall effect of environmental effects upon the globalisation-induced economic growth, trade, capital flow, urbanisation and institutional quality. Ecological footprints of India are shown in Figure 1.

## 3. METHODOLOGY

### 4.1. Data and Variables

This research is an applied research following an empirical design. The objectives of this research are to identify the impact of institutional quality, foreign direct investment, openness and urbanisation towards the ecological footprints of India. The data source is the World Bank World Development Indicators and Global Footprints database, and the time period is from 2000 to 2024. Data descriptions with their proxies, unit of measurement and sources are shown in Table 1.

**Table 1: Variables list**

| Variables used | Proxies | |
|---|---|---|
| Ecological Footprints | Ecological Footprints (Total) | Global Footprints data |
| Economic Growth | Gross Domestic Product Per Capita (constant 2015UD$) | World Bank World Development Indicators |
| Institutional Quality | Government Effectiveness (Estimate) | |
| Openness | Exports and import of goods and services upon gross domestic product | |
| FDI | Inward FDI | |
| Urbanisation | Urban population (% of total population | |

## 4.2. Model

Based on the discussions in the previous section, the main model can be written as follows

$$EF = f(GDPPC, IQ, TOP, IFDI, UP) \quad (1)$$

The above model is expressed in linear equation form below in equation 2

$$EF_t = f(GDPPC_t, IQ_t, TOP_t, IFDI_t, UP_t) \quad (2)$$

All variables are converted into their natural logarithmic form to maintain consistency and overcome multicollinearity issues (Bekhet and Othman, 2017). The long run and short run forms of the equation are shown in equation (3)

$$EF_{t-1} = \beta 0 + \sum_{i=1}^{p} \beta 1 \Delta GDPPC_{t-1} + \sum_{i=1}^{p} \beta 2 \Delta IQ_{t-1} + \sum_{i=1}^{p} \beta 3 \Delta TOP_{t-1} + \sum_{i=1}^{p} \beta 4 IFDI_{t-1} + \sum_{i=1}^{p} \beta 5 \Delta UP_{t-1} + \lambda_1 \Delta GDPPC_{t-1} + \lambda_2 \Delta IQ_{t-1} + \lambda_3 \Delta TOP_{t-1} + \lambda_4 \Delta IFDI_{t-1} + \lambda_5 \Delta UP_{t-1} + \varepsilon_t \quad (3)$$

Where t denotes the year from 2000-2024, β represents short-run coefficient and represents the long run coefficients for the dependent variables. β0 is the constant and $\varepsilon_t$ is the error term. The Cointegration test is conducted using the F test using the combined significance of variables, which follows the path as mentioned in the hypothesis below.

$H_0$: $\lambda 1 = \lambda 2 = \lambda 3 = \lambda 4 = \lambda 5 = 0$

$H_1$: $\lambda 1 \neq \lambda 2 \neq \lambda 3 \neq \lambda 4 \neq \lambda 5 = 0$

The null hypothesis of $H_0$ represents no cointegration against the alternative $H_1$ when cointegration exists. Comparing the F-statistics with the lower and upper bounds' critical values helps to check the hypothesis. We cannot reject the null hypothesis if the F-stat value is below the I(0). However, if the F-stat is above the I(0) value, we reject the null hypothesis of no cointegration. It is vital to establish the cointegration relation, after which the next step is to check for diagnostic tests to ensure model stability.

## 4.3. Econometric Specifications, Data Analysis and Interpretation

The econometric analyses undertaken in this study are shown in Figure 2.

Firstly, the data is checked for the presence of unit roots to understand the stationarity properties. Augmented Dicky Fuller unit root test is used to check the presence of unit roots for intercept and trend and intercept. Results of the unit root test are given in Table 2. All variables are integrated of order one I(1), and are converted to their first difference, and the same is considered for further analysis.

Since the variables are a mixture of I(0) at the level and I (1) at the first difference, the data is suitable for further analysis to understand their relationships (Narayan and Smyth, 2005). Secondly, after establishing the stationarity of the data, further analysis is carried out with the Auto Regressive Distributed Lag (ARDL) model. This method is extensively used to understand the long-run dynamic relationship among the variables studied, when the variables are of a combination of I(0) and I(1), and when the sample observations are small, it also successively addresses the endogeneity issues and helps to capture the dynamic relations of the variables in the long run (Pesaran et al., 2001; Pesaran and Shin, 1995). Thirdly, ARDL bounds test approach indicates the presence of long-term cointegrating relation among the variables. Fourthly, error correction estimates indicate the speed of adjustments in the disequilibrium for the model. Before running the model, the lag order is identified by calculating the lag selection criterion, as shown in Table 3.

Lag selection as per the VAR (Vector Auto Regression) Lag order selection indicates that the optimum lag is at 0, as indicated by the 4 lag selection criterion recommendations of FPE, AIC SC and HQ. This is shown in Table 3.

## 4.4. ARDL Model Results

ARDL bounds test is conducted to understand the presence of a cointegrating relationship among the variables. From Table 4, we can understand that there is cointegration among the variables, as the F-stat value of 15.31 is above the lower and upper bound at 1%, 2.5%, 5% and 10% levels of significance. So, we reject the null hypothesis of no cointegration and accept the alternative hypothesis, indicating the presence of a cointegrating relation among the variables.

After establishing a cointegrating relation among the variables, the long-run and short-run forms of the model are analysed to understand the impact of the test variables upon ecological footprints. From Table 5, we can understand the long-run and short-run dynamics of the model along with the error correction term. From the short-run coefficients, we can understand that GDPPC has a significant positive score on ecological footprint, followed by the fact that urbanisation is also significant, but shows a negative relationship with ecological footprint. The long-term results also show a similar pattern, indicating that economic

**Figure 2:** Econometric Specifications

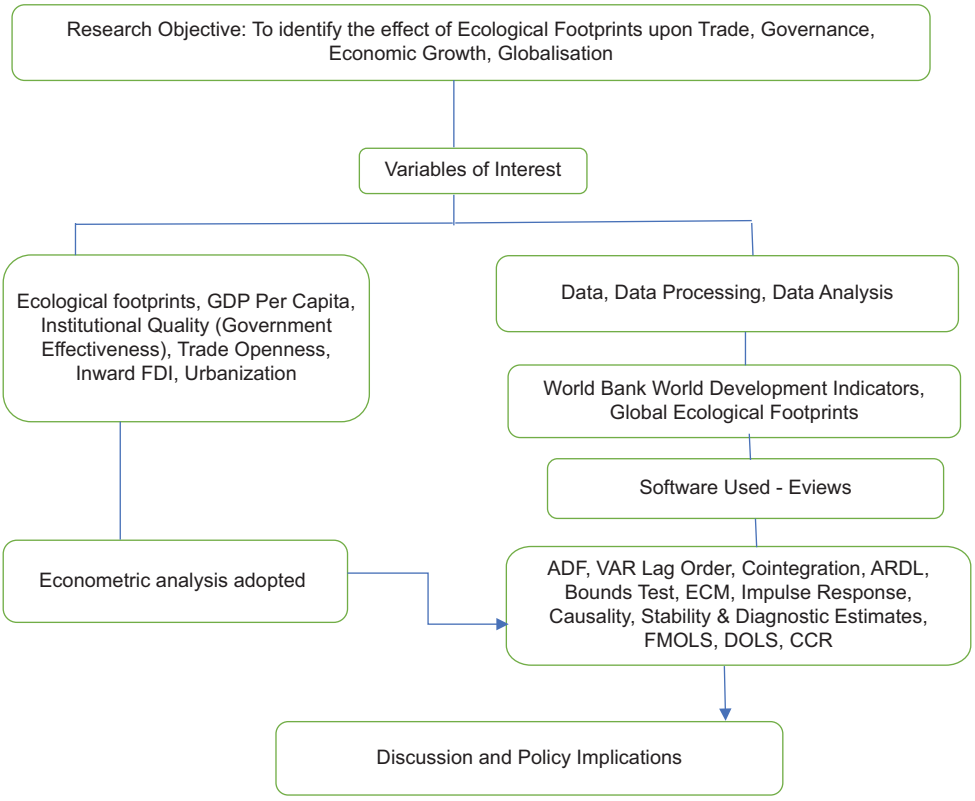



**Table 2: Unit root test – augmented Dicky Fuller test (trend and intercept)**

| Variables | At level | At first difference |
|---|---|---|
| EF | 0.48 | 0.00 |
| | (−2.16) | (−4.57) |
| GDPPC | 0.31 | 0.00 |
| | (−2.51) | (−4.44) |
| IQ | 0.49 | 0.00 |
| | (−2.14) | (−6.59) |
| TOP | 0.65 | 0.00 |
| | (−1.83) | (−4.55) |
| IFDI | 0.75 | 0.01 |
| | (−1.62) | (−5.44) |
| UP | 0.15 | 0.04 |
| | (−2.99) | (−3.69) |

**Table 3: Results of VAR lag order selection criteria**

| VAR Lag Selection Criteria<br>Endogenous Variables: lnifdi1 lngdppc1 lntop1 lnlp1 lninf1 lncorr1 lnnat1 lnpat1 lnstock lnco2<br>Exogenous Variable: C | | | | | | |
|---|---|---|---|---|---|---|
| **Lag** | **LogL** | **LR** | **FPE** | **AIC** | **SC** | **HQ** |
| 0 | 212.57 | NA | 6.37* | −17.96* | −17.66* | −17.88* |
| 1 | 247.80 | 49.06 | 7.67 | −17.89 | −15.82 | −17.37 |

*Indicates lag order selected by the criterion. LR: Sequential modified LR test statistic (each test at 5% level), FPE: Final Prediction Error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

**Table 4: Bounds test results**

| Model EF=*f* (GDPPC, IQ, TOP, IFDI, UP) | Sig Level | Lower bound | Upper bound | F-Stat |
|---|---|---|---|---|
| Critical Values for the Bounds Test | 10% | 2.75 | 3.79 | 15.31 |
| | 5% | 3.12 | 4.25 | |
| | 2.5% | 3.49 | 4.67 | |
| | 1% | 3.93 | 5.23 | |

No long-run relationship $\beta_1=\beta_2=\beta_3=\beta_4=\beta5$, No short-run relationship: $\lambda1=\lambda2=\lambda3=\lambda4=\lambda5$

**Table 5: Long-run and short-run ARDL estimations**

| Independent variables | Coefficients | Standard Error | t stat | Probability |
|---|---|---|---|---|
| Long-run estimates | | | | |
| LNGDPPC1 | 0.74 | 0.19 | 3.92 | 0.00 |
| LNGE1 | 0.00 | 0.00 | 0.53 | 0.59 |
| LNTOP1 | 0.05 | 0.0. | 1.00 | 0.32 |
| LNUP1 | −23.48 | 12.25 | −1.91 | 0.07 |
| LNIFDI1 | 0.00 | 0.01 | 0.03 | 0.97 |
| Short-run estimates | | | | |
| LNGDPPC1 | 0.90 | 0.19 | 4.55 | 0.00 |
| LNGE1 | 0.00 | 0.00 | 0.53 | 0.59 |
| LNTOP1 | 0.06 | 0.06 | 1.04 | 0.31 |
| LNUP1 | −28.27 | 15.01 | −1.88 | 0.07 |
| LNIFDI1 | 0.00 | 0.01 | 0.03 | 0.97 |
| ECT(−1) | −1.20 | 0.0. | −11.06 | 0.00 |

R-Square-0.6680, Adjusted R-Square-0.51, Durbin Watson Stat-2.52, F Stat-4.31, Prob (F-Stat)-0.00, Heteroskedasticity Breusch-Pagan-Godfrey: 0.83, Jarque-Bera (Prob): 0.69, Breusch-Godfrey Serial Correlation LM test: 0.12

growth and urbanisation go together in influencing ecological footprints. These results also reflect the rural to urban migration as the urbanisation coefficient is negative, indicating increasing pressure on land. Government effectiveness, trade openness, and inward FDI are showing a positive relation with ecological footprints in the long and short run, indicating that all increase in the same direction. The ARDL model is stable as indicated by the

probability F-statistic scores of 0.00. The model is able to explain the variations in ecological footprints to the tune of 66.8%.

The ECT is negative and significant, which indicates that the ARDL model is stable and able to return to equilibrium at the rate of 120%. Diagnostic tests for checking heteroskedasticity, normality, and serial correlation, indicated through Heteroskedasticity Breusch-Pagan-Godfrey, Jarque-Bera, and Breusch-Godfrey Serial Correlation LM test, respectively, are validated, which ensures model stability. Recursive estimates, as indicated by CUMSUM and CUSUM of squares, as shown in Figure 3, are also significant.

### 4.5. Recursive Estimates

Recursive estimates as shown in Figure 3, indicated by CUMSUM and SUMSUM of squares, are significant as shown by the blue line.

**Figure 3:** Recursive Estimates

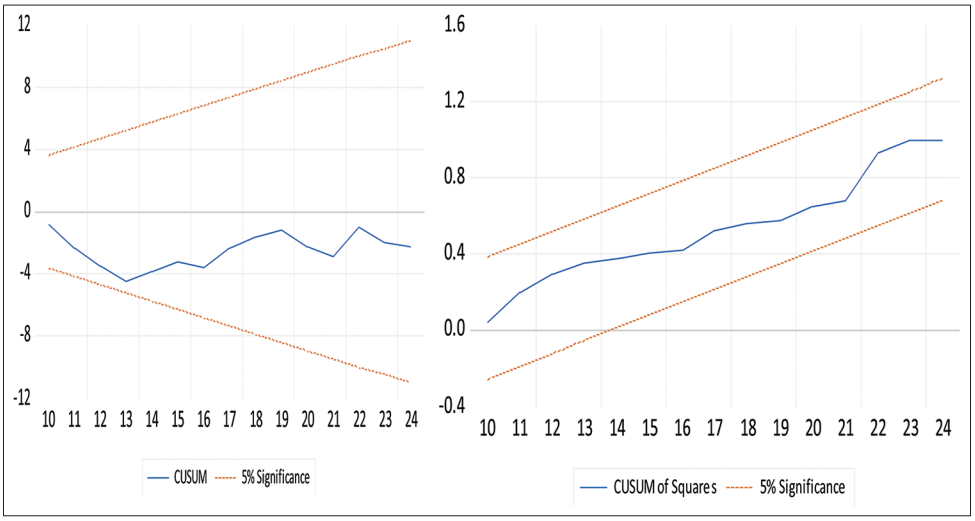



**Figure 4:** Impulse Response Function

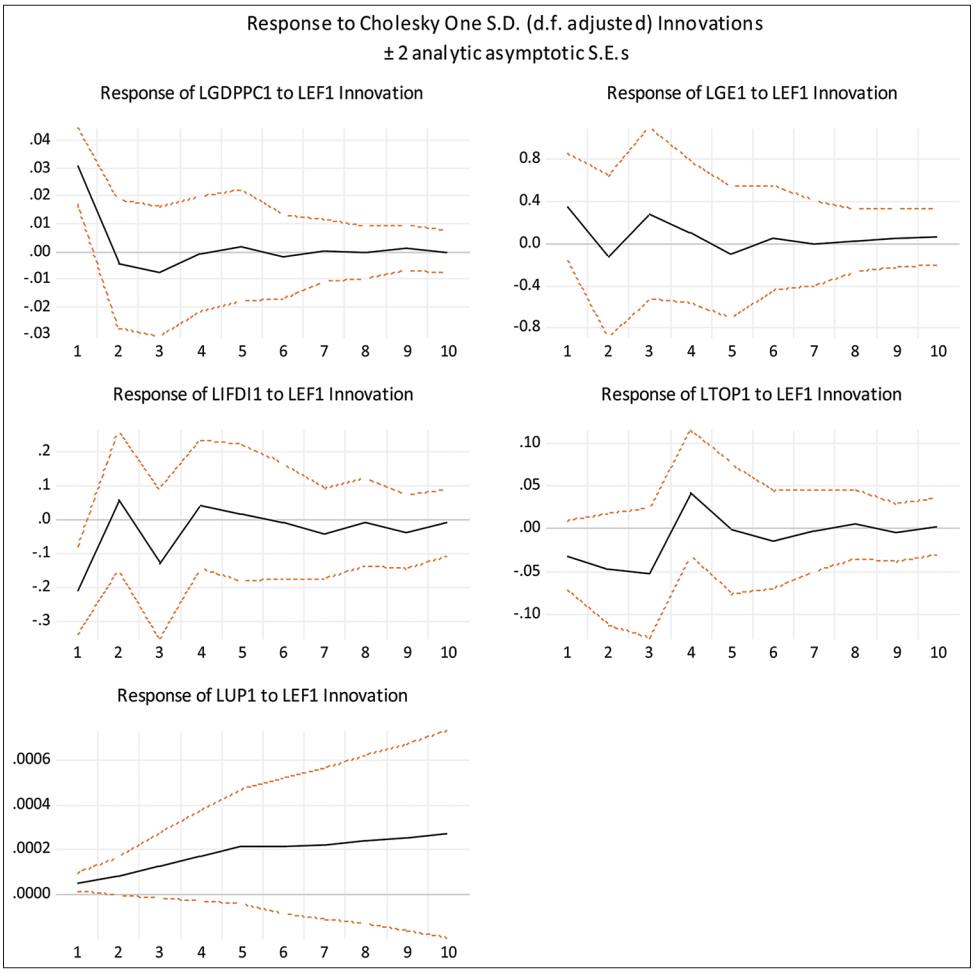


**Table 6: Cholesky IRF Table**

| Period | LGDPPC1 | LGE1 | LIFDI1 | LTOP1 | LUP1 |
|---|---|---|---|---|---|
| 1 | 0.03 (0.00) | 0.34 (0.25) | -0.20 (0.06) | -0.03 (0.02) | 5.09 (2.1) |
| 2 | -0.00 (0.01) | -0.12 (0.37) | 0.05 (0.10) | -0.04 (0.03) | 0.00 (4.4) |
| 3 | -0.00 (0.01) | 0.27 (0.40) | -0.12 (0.10) | -0.05 (0.03) | 0.00 (0.00) |
| 4 | -0.00 (0.01) | 0.10 (0.33) | 0.04 (0.01) | -0.00 (0.03) | 0.00 (0.00) |
| 5 | 0.00 (0.01) | -0.09 (0.31) | 0.01 (0.09) | -0.00 (0.03) | 0.00 (0.00) |
| 6 | -0.00 (0.00) | 0.04 (0.24) | -0.00 (0.08) | -0.01 (0.02) | 0.00 (0.00) |
| 7 | 0.00 (0.00) | -0.00 (0.20) | -0.04 (0.06) | -0.00 (0.02) | 0.00 (0.00) |
| 8 | -0.00 (0.00) | 0.01 (0.14) | 0.00 (0.06) | 0.00 (0.01) | 0.00 (0.00) |
| 9 | 0.00 (0.00) | 0.04 (0.13) | -0.03 (0.05) | 0.01 (0.00) | 0.00 (0.00) |
| 10 | -0.00 (0.00) | 0.06 (0.13) | -0.00 (0.04) | 0.00 (0.01) | 0.00 (0.00) |

Cholesky One S.D. (d.f. adjusted). Cholesky orering: LEF1 LGDPPC1 LGE1 LIFDI1 LTOP1 LUP1. Standard errors: Analytic

### 4.6. Impulse Response Function

In the Impulse Response Function (IRF) shown in Figure 4, the red line shows 95% confidence intervals, computed as ±2 standard error confidence bands, and the blue lines show the IRF of the variable. The X axis represents periods (quarters) and the Y axis represents percentage variations. IRF measures a one-standard-deviation change in the independent variable with the dependent variable. This change can be a shock, an impulse, or an innovation to FDI flow to the dependent variables.

The Cholesky table, as shown in Table 6, indicates the short and long-run outcomes of shocks in the dependent variable.

In the IRF as shown in the Cholesky table, GDPPC exhibits positive flow in the 1st, 5th, 7th, and 9th periods and negative flow in all other periods, with ecological footprints. Government effectiveness is showing positive results in 1st, 3rd, 4th, 6th, 8th, 9th and and 10th periods. Inward FDI is showing a positive relation only in the 2nd, 4th, and 5th periods, trade openness is showing a positive relation only in the 4th, 8th and 10th periods, and urbanisation is showing a positive relation across the 10-year periods. This phenomenon indicates that changes in ecological footprints upon the variables are not the same, and the outcomes of FDI flows upon all the dependent variables are asymmetrical.

### 4.7. Discussion of Results

The objective of this study is to identify the impact of economic growth, international trade, cross border capital movement, institutional quality and urbanisation upon the ecological footprints for the case of India considering the time period from 2000 to 2024, data was collected from the World Bank's World Development Indicators and Global Footprints data for the proxied variables like gross domestic product per capita, trade openness, inward foreign direct investment, government effectiveness and ecological footprints.

After checking the data for unit roots and ensuring data stability, the ARDL model was calculated, with bounds test and error correction. The model is able to explain 66.8% of the total changes occurring for ecological footprints for India happening as a result of fluctuations in GDP, trade openness, governance effectiveness, inward FDI and urbanisation. Bound test results indicate that there are long-term equilibrium relations among the test variables. Results of ARDL analysis indicate that urbanisation is showing negative relations with ecological footprints in the long and short run, and GDPPC and urbanisation are significant in the long and short run. Other variables are positive with ecological footprints. The ECT satisfies stability, showing a negative and significant coefficient score of −1.20 rate of returning to equilibrium. Stability and diagnostic tests, recursive estimates indicate significant results. Results of the impulse response function indicate that ecological footprints are showing an asymmetrical relation with all the dependent variables.

## 5. CONCLUSION AND POLICY IMPLICATIONS

An increasing number of studies have considered carbon emission as an influencing factor for identifying environmental challenges, but in this study, ecological footprints are considered for identifying the implications of economic growth on the one hand and environmental challenges on the other hand, considering government effectiveness, which adds novelty to this study.

Studies that identify the individual impact of the various governance indicators upon the functioning of macroeconomic factors on the one hand and the environment on the other hand in the case of developing countries considering regime shifting into focus are few of the areas for future exploration.

## REFERENCES

Ali, Z., Yang, J., Ali, A., Khan, A. (2024), Balancing agriculture, environment and natural resources: Insights from Pakistan's load capacity factor analysis. Clean Technologies and Environmental Policy, 26(4), 1227-1246.

Available from: https://www.pib.gov.in/pressreleaseiframepage.aspx?PRID=2042542

Azam, M., Uddin, I., Khan, S., Tariq, M. (2022), Are globalization, urbanization, and energy consumption cause carbon emissions in SAARC region? New evidence from CS-ARDL approach. Environmental Science and Pollution Research, 29(58), 87746-87763.

Cil, N. (2023), Re-examination of pollution haven hypothesis for Turkey with Fourier approach. Environmental Science and Pollution Research, 30(4), 10024-10036.

Clunies-Ross, A., Forsyth, D., Huq, M. (2009), Development Economics. UK: McGraw-Hill.

Danish, D., Ulucak, R. (2020), The pathway toward pollution mitigation: Does institutional quality make a difference? Business Strategy and the Environment, 29(8), 3571-3583.

De Neve, J.E., Sachs, J.D. (2020), The SDGs and human well-being: A global analysis of synergies, trade-offs, and regional differences. Scientific Reports, 10(1), 15113.

Dinda, S. (2004), Environmental Kuznets curve hypothesis: A survey. Ecological Economics, 49(4), 431-455.

Dörrenbächer, C., Geppert, M., Bozkurt, Ö. (2024), Multinational corporations and grand challenges: Part of the problem, part of the solution? Critical Perspectives on International Business, 20(2), 153-163.

Ebeke, C.H., Etoundi, S.M.N. (2017), The effects of natural resources on urbanization, concentration, and living standards in Africa. World Development, 96, 408-417.

Eskeland, G.S., Harrison, A.E. (2003), Moving to greener pastures? Multinationals and the pollution haven hypothesis. Journal of Development Economics, 70(1), 1-23.

Fetscherin, M., Voss, H., Gugler, P. (2010), 30 years of foreign direct investment to China: An interdisciplinary literature review. International Business Review, 19(3), 235-246.

Global Foorprints Network. (2025). Available from: Global Foorprints Network: https://www.footprintnetwork.org/. [Last accessed on 14 Jul 2025].

Gogoi, N., Hussain, F. (2024), Investigating the environmental Kuznets curve hypothesis and pollution haven hypothesis in India: An ARDL approach. International Journal of Sustainable Economy, 16(1), 16-44.

Grossman, G.M., Krueger, A.B. (1991), Environmental Impacts of a North American Free Trade Agreement. Working Paper No: 3914, NBER, Cambridge, MA 02138.

Güngör, H., Olanipekun, I.O., Usman, O. (2021), Testing the environmental Kuznets curve hypothesis: The role of energy consumption and democratic accountability. Environmental Science and Pollution Research, 28(2), 1464-1478.

Hatmanu, M., Cautisanu, C., Iacobuta, A.O. (2022), On the relationships between $CO_2$ emissions and their determinants in Romania and Bulgaria. An ARDL approach. Applied Economics, 54(22), 2582-2595.

Holtbrügge, D., Raghavan, N. (2025), Environmental effects of foreign direct investment in India: Pollution haven or pollution halo? In: Critical Perspectives on International Business. United Kingdom: Emerald Group Publishing Ltd.

Klier, H., Schwens, C., Zapkau, F.B., Dikova, D. (2017), Which resources matter how and where? A meta-analysis on firms' foreign establishment mode choice. Journal of Management Studies, 54(3), 304-339.

Krugman, P. (2000), Fire-sale FDI. In: Capital Flows and the Emerging Economies: Theory, Evidence, and Controversies. Chicago: University of Chicago Press. p43-58.

Le, H.P., Ozturk, I. (2020), The impacts of globalization, financial development, government expenditures, and institutional quality on $CO_2$ emissions in the presence of environmental Kuznets curve. Environmental Science and Pollution Research, 27(18), 22680-22697.

Lucas, R.E. (1998), On the mechanics of economic development. Econometric Society Monographs, 29, 61-70.

MOSPI. (2024), Ministry of Statistics and Programme Implementation, Government of India. Available from: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2042542

Murthy, K.B., Gambhir, S. (2017), International trade and foreign direct investment: Empirical testing of the trade-environment triangle. Transnational Corporations Review, 9(2), 122-134.

Murthy, K.B., Gambhir, S. (2018), Analyzing environmental Kuznets curve and pollution haven hypothesis in India in the context of domestic and global policy change. Australasian Accounting, Business and Finance Journal, 12(2), 134-156.

Narayan, P., Smyth, R. (2005), Trade liberalization and economic growth in Fiji. An empirical assessment using the ARDL approach. Journal of the Asia Pacific Economy, 10(1), 96-115.

Ozturk, I., Farooq, S., Majeed, M.T., Skare, M. (2024), An empirical investigation of financial development and ecological footprint in South Asia: Bridging the EKC and pollution haven hypotheses. Geoscience Frontiers, 15(4), 101588.

Paul, J., Benito, G.R. (2018), A review of research on outward foreign direct investment from emerging countries including China: What do we know? How do we know and where should we be heading? Asia Pacific Business Review, 24(1), 90-115.

Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Pesaran, M.H., Shin, Y. (1995), An autoregressive distributed lag modelling approach to cointegration analysis. Cambridge, UK: Department of Applied Economics, University of Cambridge. Vol. 9514. p371-413.

Rana, R., Sharma, M. (2019), Dynamic causality testing for EKC hypothesis, pollution haven hypothesis and international trade in India. The Journal of International Trade and Economic Development, 28(3), 348-364.

Romer, P.M. (1990), Endogenous technological change. Journal of Political Economy, 98(5, Part 2), S71-S102.

Uzar, U. (2021), The relationship between institutional quality and ecological footprint: is there a connection?. Natural Resources Forum. Vol. 45. No. 4. pp. 380-396.

Van Tulder, R., Rodrigues, S.B., Mirza, H., Sexsmith, K. (2021), The UN's sustainable development goals: Can multinational enterprises lead the decade of action? Journal of International Business Policy, 4(1), 1.

Wong, C.W., Lai, K.H., Shang, K.C., Lu, C.S., Leung, T.K.P. (2012), Green operations and the moderating role of environmental management capability of suppliers on manufacturing firm performance. International Journal of Production Economics, 140(1), 283-294.

Zhang, C., Zhou, X. (2016), Does foreign direct investment lead to lower $CO_2$ emissions? Evidence from a regional analysis in China. Renewable and Sustainable Energy Reviews, 58, 943-951.

Zhang, B., Zhang, Y., Zhang, K., Zhang, Y., Ji, Y., Zhu, B., & Ge, X. (2023), Machine learning assesses drivers of PM2. 5 air pollution trend in the Tibetan Plateau from 2015 to 2022. Science of the Total Environment, 878, 163189.