DESIDOC Journal of Library & Information Technology, Vol. 44, No. 6, November 2024, pp.418-424, DOI : 10.14429/djlit.44.6.19890


# Beneficiary Correlation on NLIST Services in Colleges of Assam: A Nationwide Assessment

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**ABSTRACT**

This study aims to analyse the implementation of the NLIST project in the state of Assam through beneficiary relationship analysis and compare it with the national status. Factor analysis of beneficiary relationships and their impact is crucial for measuring project efficiency. For this purpose, statistical correlation techniques are used to measure the factors affecting project beneficiaries. The correlation coefficient for the state of Assam is measured, and the degree of correlation is compared with the national status to examine the project's performance. The correlation coefficient is used to measure the degree of correlation between beneficiaries and registered member institutes from tabulated data collected from the INFLIBNET website (https://nlist.inflibnet.ac.in/). The correlation coefficients at the state and national levels demonstrate a positive and robust relationship. However, the degree of correlation within Assam is slightly lower than the national average, meaning that the effectiveness of project implementation at Assam is lower than that of national performance. The assessment of beneficiaries underscores the significant impact of the COVID-19 pandemic on their growth in Assam. There is a need to improve service quality, accessibility, proper feedback mechanisms, collaboration with stakeholders and the availability of multidisciplinary resources.

**Keywords:** NLIST; UGC-INFONET; e-ShodhSindhu; INFLIBNET; Consortium; E-resource; Correlation coefficient; College; Assam

## 1. INTRODUCTION

The National Library & Information Services Infrastructure for Scholarly Content (NLIST) is a consortium-driven e-resources project to deliver scholarly content to colleges[1]. The project primarily encompasses government and government-aided colleges falling under the UGC Act's provisions of 12B & 2(f). Non-aided private colleges can also access resources by paying an annual fixed amount. As of October 6, 2023, the project boasts about 6549 registered colleges, with 4214 actively benefiting from the initiative. Among these, 3859 hold 12B status, while 355 are non-aided colleges. Notably, 2335 registered colleges have not renewed their membership or remained inactive, rendering them as non-beneficiaries of the project[2]. The registered members significantly influence the growth rate of project beneficiaries and changes in this dynamic substantially impact project effectiveness. This study recognises the importance of measuring beneficiary relationships to ascertain project efficiency. Specifically, the research aims to gauge the beneficiary correlation in Assam and the rest of India to understand better and enhance the NLIST project's overall efficiency in the college of Assam.

Received : 06 February 2024, Revised : 19 July 2024
Accepted : 29 July 2024, Online published : 12 November 2024

## 2. NLIST AN OVERVIEW

The project initiated by the Ministry of Human Resource Development of India on May 4, 2010[3-6], is a collaborative effort between the UGC-INFONET Digital Library Consortium (UGC-INFONET-DLC) of INFLIBNET Centre and the INDEST-AICTE Consortium of IIT, Delhi[3-5-9]. Following an expert committee's recommendation, the e-ShodhSindhu consortium was established in 2014 by merging the UGC-INFONET-DL consortium, NLIST, and INDEST-AICTE Consortium[3]. As part of the UGC-INFONET-DL Consortium, the college component of the e-ShodhSindhu consortium currently benefits 767,354 active members nationwide[4]. The INFLIBNET centre oversees the NLIST project, implementing policies and guidelines issued by a joint meeting of NSCs in alignment with NME-ICT for e-resource usage and distribution[3]. Key functions include providing full-text e-resources, establishing reliable access mechanisms, distributing scholarly content, addressing infrastructure gaps, promoting resource usage awareness, managing usage statistics and facilitating internet access-enabled laboratories in beneficiary institutions. Government and government-aided colleges benefit automatically, while private colleges can join for an annual fee to access selected scholarly e-resources suitable for college-level education.

## 3. LITERATURE REVIEW

Mandhirasalam and Srinivasa[5] study highlights a surge in college affiliations with the project, attributing it to the electronic resources facilitated by NLIST. Kumar[8] emphasises NLIST's role in addressing a substantial void in learning resources by granting college's access to electronic resources. Solanki[9] posits that offering online access to e-resources for both students and faculty has the potential to reshape the landscape of higher education. Pallavi[10] underscores INFLIBNET's pivotal role since its establishment in 1991, marking a significant milestone in India's library network evolution. Kaushal[3] advises the inclusion of more diverse, curriculum-based content in NLIST e-resources. Kaur[11] describes INFLIBNET as a bridge connecting information needs and distribution through NLIST. Kamble and Surwade[12] conclude that consortia serve as one of the effective tools for budgetary savings in e-resources. Shilpa Rani[13] notes a progressive surge in e-resource utilisation, attributing it to the transformative impact of NLIST in colleges. According to Malipatil[14], INFLIBNET acts as a conduit connecting colleges with NLIST e-resources. Mamatha[15] points out that while most college library users lack sufficient knowledge about e-resources, there is a keen interest in obtaining them. George & Pillai and Aparna[16] highlights the success of the N-List program in providing e-resources to colleges and foresees its potential for further expansion. Gate[17] in his study stated that searching for banking words in the NLIST database reader can provide a wide variety of reading materials on banking and commerce.

## 4. OBJECTIVES OF THE STUDY

The purpose and objectives of the study are

- To explore the present status of NLIST beneficiaries in the state of Assam
- To determine the beneficiary correlation of the NLIST Program for the state of Assam and nationwide
- To analyse the beneficiary correlation for the state of Assam and compare it with national status
- To analyse the project implementation through beneficiary correlation

## 5. METHODOLOGY

The study aims to evaluate the performance of the NLIST program in Assam by assessing the status of its beneficiaries. Utilising a descriptive approach, the research explicates the status of NLIST beneficiaries in Assam and examines the relationship of beneficiaries with the impact of relevant factors. The study data on registered colleges and beneficiaries in Assam and across the country are obtained from the state-wise list of NLIST program members on the INFLIBNET website (https://nlist.inflibnet.ac.in) from the inception of the program till 6th October 2023. The information regarding the district-wise list of colleges in Assam (until October 6, 2023) has been collected from a compiled list of colleges of the MIS for the Directorate of Higher Education of Assam and the list of colleges affiliated by all affiliating Universities of Assam, which include Gauhati University, Dibrugarh University, Assam University and Bodoland University of Assam. The collected data further organised, tabulated, and presented in plot graphs for analysis. The Pearson

**Table 1. District wise number of beneficiaries, registered college and total number of colleges**

| District | No. of college | RC | % of RC | BC | % of BC |
|---|---|---|---|---|---|
| Sivasagar | 14 | 14 | 100% | 12 | 85.71% |
| Kokrajhar | 11 | 9 | 81.81% | 8 | 72.72% |
| Morigaon | 11 | 8 | 72.72% | 8 | 72.72% |
| Charaideo | 7 | 5 | 71.43% | 5 | 71.43% |
| Biswanath | 6 | 04 | 66.66% | 04 | 66.66% |
| Nalbari | 13 | 10 | 76.92% | 8 | 61.54% |
| Kamrup(M) | 35 | 21 | 60.00% | 15 | 60.00% |
| Jorhat | 24 | 14 | 58.33% | 13 | 58.33% |
| Golaghat | 19 | 14 | 73.68% | 11 | 57.89% |
| Goalpara | 16 | 8 | 50.00% | 7 | 50.00% |
| Majuli | 6 | 3 | 50.00% | 2 | 50.00% |
| Tinsukia | 17 | 11 | 64.71% | 8 | 47.06% |
| Dibrugarh | 28 | 12 | 42.86% | 12 | 42.85% |
| Bongaigaon | 14 | 7 | 50.00% | 6 | 42.85% |
| Darrang | 12 | 5 | 41.67% | 5 | 41.67% |
| Chirang | 8 | 4 | 50.00% | 3 | 37.5 % |
| Udalguri | 11 | 5 | 45.45% | 4 | 36.36% |
| Nogaon | 39 | 20 | 51.28% | 14 | 35.89% |
| Lakhimpur | 28 | 16 | 57.14% | 10 | 35.71% |
| Dhubri | 19 | 9 | 47.37% | 6 | 31.58% |
| Barpeta | 32 | 14 | 43.75% | 10 | 31.25% |
| Karimganj | 16 | 8 | 50.00% | 5 | 31.25% |
| Baksa | 13 | 04 | 30.76% | 04 | 30.76% |
| Demaji | 25 | 13 | 52.00% | 7 | 28.00% |
| Dima-Hasao | 4 | 1 | 25.00% | 1 | 25.00% |
| Cachar | 26 | 9 | 34.61% | 6 | 23.08% |
| Sonitpur | 22 | 5 | 22.72% | 5 | 22.72% |
| Karbi-Anglong | 15 | 4 | 26.67% | 3 | 20.00% |
| Kamrup (R) | 101 | 19 | 18.81% | 18 | 18.81% |
| Hailakandi | 11 | 3 | 27.27% | 2 | 18.18% |
| Hajai | 9 | 1 | 11.11% | 1 | 11.11% |
| **Total** | **612** | **280** | **45.75%** | **223** | **36.44%** |

**Source: A compiled list of DHE, Assam, all affiliating Universities of Assam and INFLIBNET.**
**RC=Registered College, BC= Beneficiary College**

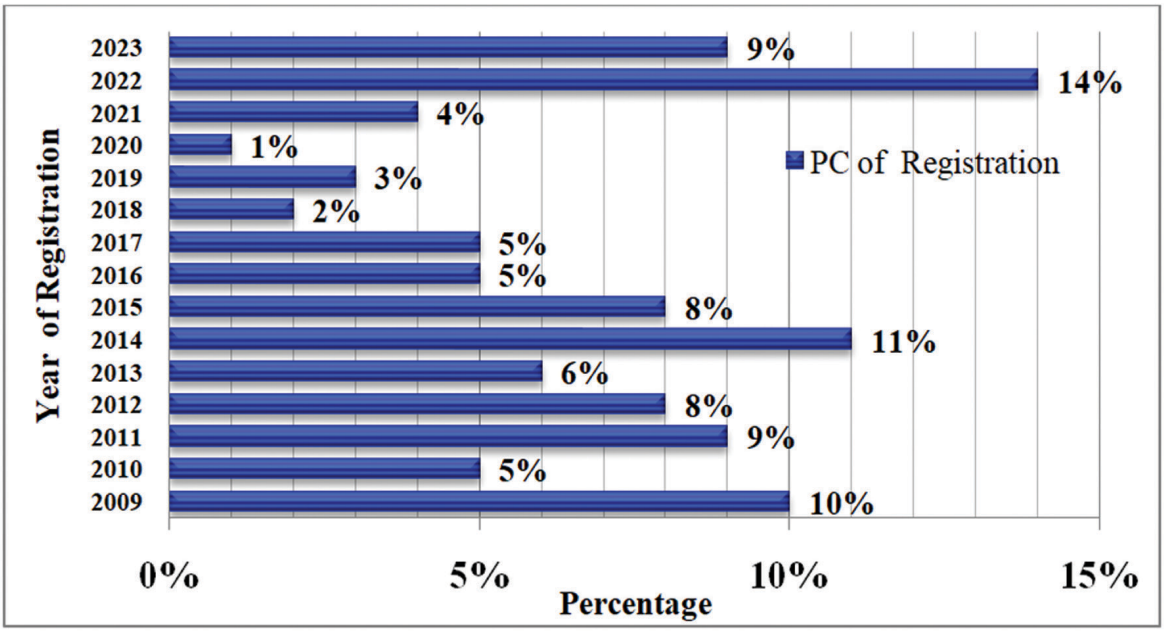


**Figure 1. Year wise percentage of the NLIST registered colleges in Assam.**

Correlation Coefficient (PCC)[18-19] is used to assess the degree of correlation between registered member institutes and beneficiaries. PCC predicts the relationship between two qualities, commonly known as the cross-correlation[19] coefficient denoted as "r", calculated by a specific formula,

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

where X and Y represent two variables, respectively.

Here,

n = Number of value or elements;

$\sum x$= Sum of 1st values list;

$\sum y$= Sum of 2nd values list;

$\sum xy$= Sum of product of 1st and 2nd values;

$\sum x^2$ = Sum of squares 1st values; and

$\sum y^2$ = Sum of squares 2nd values[19]

In this analytical study, the degree of correlation between the variables is calculated by treating the institute of registered members and beneficiaries as X and Y, respectively. The objective is to portray the overall situation of beneficiaries in Assam by calculating the Correlation Coefficient (CC) for Assam and analysing the correlation compared to the national level. The CC helps measure the strength and direction of the relationship between the number of registered member institutions and the corresponding beneficiaries, providing insights into the program's impact in the specific region of Assam compared the national context.

## 6. OVERVIEW OF THE NLIST REGISTERED COLLEGES IN ASSAM

In Assam, there are 612 colleges, including private, govt. college and govt.-aided college; however, only 280 (Table 1) are registered under NLIST as per data recorded on 06/10/2023. The non-aided colleges or private colleges registered under the scheme are negligible (2 nos. only) compared to Govt. and Govt.-aided colleges. Analysed the percentage of the number of colleges registered annually since project inception to measure the project efficiency (as shown in Fig. 1), the registration rate increased from 5 % to 11 % from 2009 to 2017, but from 2018 to 2020 it suddenly dropped to 2 %, 3 %, and 1 %, respectively. The registration rate of colleges is expected to decline from 2018 to 2020 as all academic activities including library services, were suspended due to the adverse impact of the COVID-19 pandemic. However, after gradually disappearing of the COVID-19 pandemic, the registration rate (as shown in Fig. 1) increased significantly in 2021 (4 %), 2022 (14 %), and 2023 (9 %).

The NLIST effectiveness of the project depends on how many colleges register under the project and receive the services as beneficiaries. In this regard, the activities of the beneficiaries under the project were monitored through a district-wise comparative analytical study of registered colleges and beneficiaries against the total number of colleges in Assam. In Assam, Table 1 shows that 45.75 % of colleges registered under the project have covered 36.44 % of colleges as beneficiaries. In comparison, only 11 out of 32 study districts covered 50 % of beneficiary institutions, which indicates that the project implementation was significantly less effective.

## 7. BENEFICIARY CORRELATION IN THE STATE OF ASSAM AND THE COUNTRY

The beneficiary of the NLIST program in Table 2 & Table 3 serving as active registered members (beneficiary) receiving program services is designated as the variable Y. Conversely, the variable X comprises the registered member colleges which bear a crucial relationship with the growth rate of beneficiaries. In this context, the Pearson Correlation Coefficient is computed for both the state of Assam and the country (India)

**Table 2. District wise NLIST beneficiaries (Y) against the registered colleges (X) in Assam**

| District | Registered college (X) | Beneficiary college (Y) | XY | $X^2$ | $Y^2$ |
|---|---|---|---|---|---|
| Dima-Hasao | 1 | 1 | 1 | 1 | 1 |
| Dibrugarh | 12 | 12 | 144 | 144 | 144 |
| Charaideo | 5 | 5 | 25 | 25 | 25 |
| Biswanath | 04 | 04 | 16 | 16 | 16 |
| Baksa | 04 | 04 | 16 | 16 | 16 |
| Morigaon | 8 | 8 | 64 | 64 | 64 |
| Sonitpur | 5 | 5 | 25 | 25 | 25 |
| Darrang | 5 | 5 | 25 | 25 | 25 |
| Kamrup (R) | 19 | 18 | 37 | 361 | 324 |
| Jorhat | 14 | 13 | 182 | 196 | 169 |
| Kokrajhar | 9 | 8 | 72 | 81 | 84 |
| Goalpara | 8 | 7 | 56 | 64 | 49 |
| Sivasagar | 14 | 12 | 168 | 196 | 144 |
| Bongaigaon | 7 | 6 | 42 | 49 | 36 |
| Nalbari | 10 | 8 | 80 | 100 | 64 |
| Udalguri | 5 | 4 | 20 | 25 | 16 |
| Golaghat | 14 | 11 | 154 | 196 | 121 |
| Karbi-Anglong | 4 | 3 | 12 | 16 | 12 |
| Chirang | 4 | 3 | 12 | 16 | 12 |
| Tinsukia | 11 | 8 | 88 | 121 | 64 |
| Kamrup (M) | 21 | 15 | 315 | 441 | 225 |
| Nogaon | 20 | 14 | 280 | 400 | 196 |
| Hajai | 1 | 1 | 1 | 1 | 1 |
| Barpeta | 14 | 10 | 140 | 196 | 100 |
| Cachar | 9 | 6 | 36 | 81 | 36 |
| Majuli | 3 | 2 | 6 | 9 | 4 |
| Hailakandi | 3 | 2 | 6 | 9 | 4 |
| Dhubri | 9 | 6 | 54 | 81 | 36 |
| Karimganj | 8 | 5 | 40 | 64 | 25 |
| Lakhimpur | 16 | 10 | 160 | 256 | 100 |
| Demaji | 13 | 7 | 91 | 169 | 49 |
| | **$\sum x = 280$** | **$\sum y = 223$** | **$\sum xy = 2368$** | **$\sum x^2 = 3444$** | **$\sum y^2 = 2187$** |

**Source: https://nlist.inflibnet.ac.in/vcollegestate.php (data recorded on 06/10/2023)**

using the appropriate formula. In correlation analysis variables (X and Y) are tabulated in Table 2 & Table 3 to evaluate the relationship between registered member colleges and growth rate of beneficiaries in both Assam and Nationwide. Now, substitute all the values in the below formula.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Here, the tabulated values for Assam (Table 2) are n=30; $\sum x=280$; $\sum y=223$; $\sum xy=2368$; $\sum x^2=3444$; and $\sum y^2=2187$. Now, substitute the values in the formula for correlation coefficient. Correlation coefficient for state of Assam $r_1 = 0.4323004$.

Here, the tabulated values for Nationwide (India) (Table 3.) are n=36; $\sum x=6549$; $\sum y=4190$; $\sum xy=2321678$; $\sum x^2=3403091$; and $\sum y^2=1656318$.

Now, substitute the values in the formula for correlation coefficient.

Correlation coefficient for the Nationwide (India) $r_2 = 0.96998$.

## 8. DISCUSSION

The correlation analysis of the Registered college (X) and Beneficiary (Y) reveals correlation coefficients for the state of Assam ($r_1 = 0.4323004$) and the Nationwide ($r_2=0.96998$). In both cases, the correlation coefficient is a positive real number ($r>0$), indicating a strong positive correlation between the number of registered

**Table 3. State wise NLIST beneficiaries (Y) against the registered colleges (X) in the country**

| Name of the state | Registered college (X) | Beneficiary colleges (Y) | (XY) | $X^2$ | $Y^2$ |
|---|---|---|---|---|---|
| Dadra & Nagar Haveli | 3 | 3 | 9 | 9 | 9 |
| Daman & Diu | 1 | 1 | 1 | 1 | 1 |
| Goa | 33 | 31 | 1023 | 1089 | 961 |
| Chandigarh | 15 | 14 | 210 | 225 | 196 |
| West Bengal | 409 | 355 | 145195 | 167281 | 126025 |
| Meghalaya | 30 | 26 | 780 | 900 | 676 |
| Delhi | 78 | 67 | 5226 | 6084 | 4489 |
| Assam | 280 | 233 | 65240 | 78400 | 54289 |
| Kerala | 304 | 246 | 74784 | 92416 | 60516 |
| Tamil Nadu | 451 | 356 | 160556 | 203401 | 126736 |
| Maharashtra | 1280 | 962 | 1231360 | 1638400 | 925444 |
| Nagaland | 34 | 25 | 850 | 1156 | 625 |
| Andhra Pradesh | 276 | 193 | 53268 | 76176 | 37249 |
| Arunachal Pradesh | 9 | 6 | 54 | 81 | 36 |
| Himachal Pradesh | 54 | 36 | 1944 | 2916 | 1296 |
| Panjab | 169 | 111 | 18759 | 28561 | 12321 |
| Jammu & Kashmir | 101 | 65 | 6565 | 10201 | 4225 |
| Chhattisgarh | 206 | 129 | 26574 | 42436 | 16641 |
| Mizoram | 24 | 15 | 360 | 576 | 225 |
| Haryana | 181 | 109 | 19729 | 32761 | 11881 |
| Telengana | 159 | 95 | 15105 | 25281 | 9025 |
| Karnataka | 759 | 452 | 343068 | 576081 | 204304 |
| Tripura | 21 | 12 | 252 | 441 | 144 |
| Paducherry | 25 | 14 | 350 | 625 | 196 |
| Andaman & Nicobar Islands | 2 | 1 | 2 | 4 | 1 |
| Jharkhand | 115 | 52 | 5980 | 13225 | 2704 |
| Uttarakhand | 37 | 16 | 592 | 1369 | 256 |
| Uttar Pradesh | 273 | 117 | 31941 | 74529 | 13689 |
| Manipur | 56 | 24 | 1344 | 3136 | 576 |
| Rajasthan | 174 | 64 | 11136 | 30276 | 4096 |
| Orissa | 112 | 38 | 4256 | 12544 | 1444 |
| Madhya Pradesh | 264 | 139 | 36696 | 69696 | 19321 |
| Sikkim | 5 | 3 | 15 | 25 | 9 |
| Gujarat | 423 | 106 | 44838 | 178929 | 11236 |
| Bihar | 184 | 74 | 13616 | 33856 | 5476 |
| Ladakh | 2 | 0 | 0 | 4 | 0 |
| | **$\sum x=6549$** | **$\sum y=4190$** | **$\sum xy=2321678$** | **$\sum x^2=3403091$** | **$\sum y^2=1656318$** |

**Source: https://nlist.inflibnet.ac.in/vcollegestate.php (data recorded on 06/10/2023)**

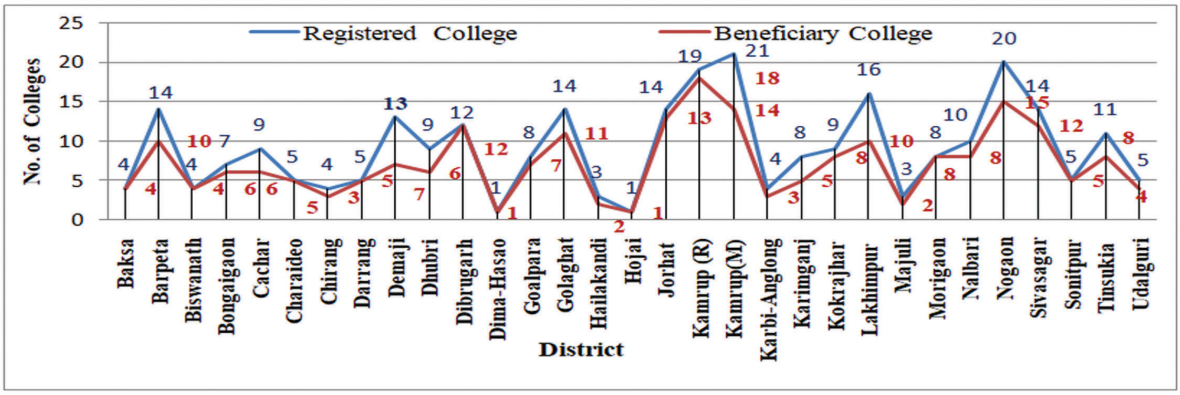


**Figure 2. District-wise number of NLIST beneficiaries vs. registered member colleges in Assam.**

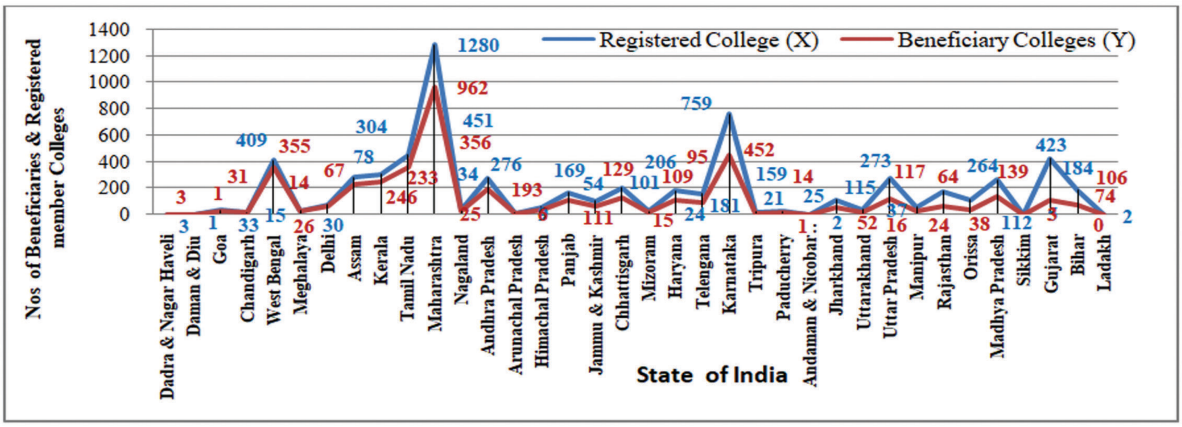


**Figure 2. State-wise number of NLIST beneficiaries vs. registered member colleges in India.**

college and the growth rate of beneficiaries. The degree of correlation in the case of Assam is found less than the national average and less perfect. A lower correlation demonstrates a greater influence of registered colleges on beneficiary growth rate, indicating lower performance in project implementation. A distinct difference in the beneficiary relationship between the state of Assam and the nationwide is shown in Figure 2 and Figure 3. This beneficiary relationship analysis of Assam demonstrates that the effectiveness of NLIST projects is lower than the national average. The enrollment rate in colleges in Assam under this program was significantly affected by the COVID-19 pandemic, which resulted in a sudden decline in enrollment from 2018 to 2020, but the notable increase at the end of the COVID-19 pandemic had a significant impact on the growth rate. On the Other hand, the accessibility, utility and facility creation for e-resources in Assam's colleges is deemed unsatisfactory, as the project has been unable to cover 40 % of the colleges in the state (currently beneficiaries at 36.44 %) after 13 years of implementation.

## 9. CONCLUSION

The degree of correlation in the case of Assam is found less than the national average, this indicates the efficiency of NLIST project implementation in the state is lower than national performance. In states like Assam, where information literacy and digital initiatives are below the national level, expanding the coverage of beneficiaries under the project is imperative. This can be achieved through various extension programs such as awareness camps, training sessions, marketing of NLIST resources and increased publicity. To further enhance the project's effectiveness, there is a need to improve service quality, accessibility, proper feedback mechanism, collaboration with stakeholders and the availability of multidisciplinary resources. These initiatives are crucial to enhance the effectiveness of the project to support scholarly activities to attract more beneficiaries under the project in states like Assam.

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His contribution to the current study has been developing the conceptual framework, drafting, data collection analysis, and representation.