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ABOUT THE COLLEGE

Hansraj College is one of the largest constituent colleges of the University of Delhi. The college was founded by the D.A.V. College Managing Committee on 26th July, 1948 in the sacred memories of Maharshi Dayanand Saraswati and Mahatma Hansraj who spent their magnificent lives emphasizing the importance of knowledge. It is one of the leading lights in the D.A.V. family of over 700 institutions.

Hansraj College is a premier institution dedicated to teaching and research. It has highly qualified academicians who impart education in Science, Commerce, and Arts at undergraduate and graduate levels to more than 5000 students. The college has consistently demonstrated outstanding performance in academics, sports, and extracurricular activities.

The college has completed 75 years in the realm of imparting higher education. It has made significant and unparalleled contributions in terms of producing scholars, bureaucrats, intellectuals, and sportsperson serving in different domains not only in our own country but even at international levels.

Hansraj College stands at the cusp between the past and the future today. While it retains inspiring facets of its proud history, with an equally sharp gaze it looks ahead, assimilating the exciting world of new knowledge as it unfolds in front of it, holding the promise of an experience seeped with exhilarating learning and holistic growth for all those who enter its portals.

About the Journal

The *HRC Journal of Economics and Finance* is a **double-blind peer-reviewed academic journal** for students, researchers, and faculty to showcase their research pertaining to the discipline of economics and business. It is an international journal. Our mission is to provide a platform through which scholars can publish their scholarly findings to showcase them with the research community at large. We invite research papers and articles on topics related to the field of economics, business and management for its quarterly journal publication.

Message from the Principal

The launch of the *HRC Journal of Economics and Finance* is a milestone that marks our dedication towards providing a platform to young researchers in the field of economics and finance. It is even more fortuitous that the launch has been manifested in the Platinum jubilee year of the college, the Centenary year of the University of Delhi and the 75th year of India's independence.

The New Education Policy, 2020 has launched a paradigm shift that encourages research both at the faculty and student level. Accordingly there is a growing need to provide credible platforms to present research outputs at all levels. This journal fills a significant gap and will contribute to fostering a research ecosystem thereby advancing the objectives of the NEP 2020. This journal will provide an opportunity to students, teachers and scholars, around the world to come together and showcase the links between classroom teaching and their practical training.

I congratulate the authors whose papers/articles have been published in the journal and encourage others to contribute to future issues. Appreciation is due to the Editor In-Chief of this journal, Dr. Apoorva Gupta who has worked tirelessly for the successful launch of this journal. My best wishes for the success of this venture.

Prof. (Dr.) Rama
Principal
Hansraj College

From the Editor's Desk

Dear Readers,

It is my great pleasure and privilege to present the first issue of the second volume of the Journal of the Hansraj College, the *HRC Journal of Economics and Finance*. The journal provides a platform to young researchers in the field of economics, business, social sciences, finance and management to publish their scholarly articles. Our inclusive nature ensures that we cover the wide range of issues in the field. This issue features a diverse range of articles that provide insightful analyses and innovative perspectives on various contemporary economic topics.

We have received around thirty papers relevant to the field of development economics, political economy, macroeconomic policy, financial markets, international trade, and behavioral economics. All the papers went through three rounds of review process, first by the editors and then by the review board. All the papers have gone through double blind peer review process. The authors were communicated with the revisions. The papers were accepted only after the satisfactory revisions were being made. We strictly follow the research ethics and do not tolerate plagiarism. All the selected papers were tested for plagiarism before publication. We have worked tirelessly to bring out this issue of the journal with high quality research work.

Writing quality research papers takes a lot of time and effort, and the authors must be congratulated for writing their research papers for the journal, which is launched in the Platinum Jubilee year of the college, the Centenary year of the University of Delhi and the 75th year of India's independence. We also take this opportunity to congratulate the review board of this issue for their constant academic support for the timely release of the journal. We also thank the support received from the Principal of the college, Prof. (Dr.) Rama, the Advisory Board and the Editorial Board.

We hope that readers find the articles interesting, informative and engaging, and enjoy reading it. We believe that this effort of ours will stimulate further research and discussion in the field of economics and finance, and encourage readers to write for further issues of the journal. We look forward to receiving your feedback and suggestions for future issues.

Disclaimer: The opinions expressed in this journal belong to the contributors and do not necessarily reflect the viewpoints of the college, the editors, the Advisory Board, the Editorial Board, and the Review Board of the *HRC Journal of Economics and Finance*.

Dr. Apoorva Gupta

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Conditional Cash Transfer

Kanyashree Prakalpa in West Bengal: Achievements and Concerns

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Delhi¹

Abstract

Conditional Cash Transfer (CCT) programs emerged in the late 1990s in Latin America and have become the popular mode of alleviating poverty in developing countries. This paper underlines the effectiveness of CCTs in enhancing educational attainment of girl children in West Bengal in reference to a particular CCT scheme called the Kanyashree Prakalpa (KP) introduced in 2013. The scheme has been appreciated for being able to increase the enrolment of girl students in secondary and higher secondary education as per U-DISE (Unified District Information for Education). Certain indicators, such as early pregnancies and marriages have also reduced significantly in the state according to various rounds of NFHS (National Family Health Survey). Due to the COVID-19 pandemic, there has been a decline in the secondary education enrolment numbers although enrolment of higher secondary education continued to rise. This might be because of the incentive of the big prize waiting once one reaches higher secondary level. This paper notes that despite these incentives continued there has been a rise in early marriage in West Bengal. The paper argues that money transferred through Kanyashree Prakalpa might be losing its effective role in stopping early marriages in recent times because of lack of employment opportunities and rising uncertainty, prompting parents to opt for early marriage of their girl child.

Keywords: Kanyashree Prakalpa, West Bengal, Cash Transfer, Girl Child Education, Child Marriage

JEL Classification: I24, I38, H52, H75

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1. Introduction

Conditional cash transfer (CCT) programs are innovative ways of delivering social services since they provide money to poor families, conditional to investment in human capital. Money is transferred subject to parents sending their children to school or for taking them to neighbouring health care centres on a regular basis. This conditionality makes the new generation of social programs an instrument for long-term investments on human capital while combining them with short-term social assistance. These programs although started in the late 1990s in Latin America have now become the preferred policy of many developing countries of South East Asia aimed to alleviate poverty and to enhance human capital (Millán et. al, 2019). Mostly, all the CCTs follow a general design of the Programa de Educación, Salud y Alimentación (PROGRESA), Mexican CCT program that began in 1997. Targeted to the poor, the principal components of this program include regular cash transfers to women—conditional on scheduled visits to healthcare providers for young children, on school enrolment or regular school attendance for school-age children. The approach that CCT takes is both an alternative to more traditional assistance programs and a demand-side complement to the supply of health and education services. Additionally, the program has been successful in promoting social participation and democratic governance, as beneficiaries have been involved in the design and implementation of the program (Rawlings and Rubio, 2005).

One of the prominent examples of conditional cash transfer programs in South Asia is the Female Secondary School Stipend (FSSS), introduced in Bangladesh in 2004 that gives money to girls conditioned upon their enrolment in secondary school or relating to conditions such as maintaining regular attendance and passing grades or for remaining unmarried till the age of 18. This also induces a demand for private secondary schools in rural areas. The scheme although being successful faced criticism as it was skewed in favour of girls and led to an under-investment in male secondary schooling within the household. In India, the very first scheme with similar goals was the Apni Beti Apni Dhan (ABAD) of Haryana introduced in 1994. Under this scheme bonds of Rs 2,500 were transferred to the girl child at the time of birth, which could be redeemed at the age of eighteen conditional upon she remains unmarried and passes tenth standard. According to Nanda et al (2016), this scheme could not significantly reduce underage marriages in the state. ABAD beneficiaries appreciated the CCT only as a means to cover the marriage

and dowry expenses. Data shows that more than half of the families covered under the scheme used to spend the CCT on meeting expenses related to marriage (Sen and Dutta, 2018).

Many other schemes like the Bhagyalakshmi scheme in Karnataka (2006), Golden Jubilee Pre-Matric Scholarship scheme in Maharashtra (2010), and Mukhyamantri Laxmi Ladli Yojana launched by the government of Madhya Pradesh in 2007 and further extended to six states- Uttar Pradesh, Bihar, Delhi, Chhattisgarh, Jharkhand and Goa are scholarships-based schemes aiming to reducing school dropouts among girls. These schemes are designed to encourage girls belonging to underprivileged background and try to motivate families in educating girl children. While all these programmes facilitate women continuing with their education conditional upon successfully completing each stage of her education. However, such schemes might not turn out to be motivating enough for first-generation learners or laggards who generally struggle in passing examinations. But what has been widely acknowledged that even though these schemes are not directly meant for delaying early marriages, actually they could do so by promoting education (Sen and Dutta, 2018).

In this paper, we try to analyse the effectiveness of CCTs in enhancing the attainment of girl child education in West Bengal. With reference to a particular CCT called *Kanyashree Prakalpa* this paper shows that girl child enrollment increased significantly in the state together with decline in child marriage. However, the paper finds that despite such schemes continue to exist, there has been a rise in early marriages in West Bengal in the recent period due to lack of employment opportunities and rising uncertainties. In the following section we discuss the specifics of the scheme '*Kanyashree Prakalpa*' followed by the third section which shows the attainments in girl child enrollment and the positive trends of declining early marriages in the state. In the fourth section the paper comments on the recent trends of rising early marriage in the state and finally we conclude.

2. '*Kanyashree Prakalpa*'- Scheme Structure

A scheme, named '*Kanyashree Prakalpa*' (KP) was launched by the West Bengal government in 2013 to encourage girl child education. It not only facilitated girl child

education alike other CCT schemes introduced in other parts of the country, but tried to tackle three issues at a time namely, female foeticides, early marriage and dowry system. According to the Census 2011, compared to the all-India average of 3.7 per cent, females in West Bengal married before the age of 18 turned out to be 7.8 per cent. Interestingly, a recent analysis using District Level Household Survey (DLHS)-4-unit-level data by Sen and Modak (2017) shows that West Bengal is a peculiar state where the probability of marrying underage is not a direct outcome of poverty but because of lack of education. Hence, conditional cash transfers combined with access to education was deemed appropriate to reduce child marriage.

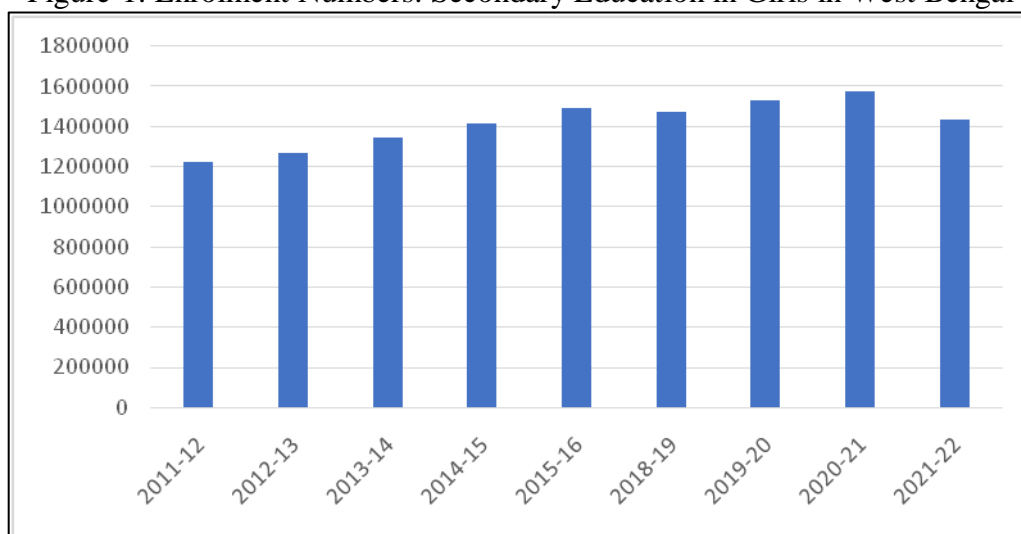
The *Kanyashree Prakalpa*, essentially a conditional cash transfer (CCT) scheme was designed to reducing underage marriage together with adolescent dropout among girls. This is a two-tier scheme: a) KP-1 or Stage 1 provides an annual grant of INR 750 for unmarried girls between the age 13 to 18 years who are enrolled in some educational institutions; b) KP-2 or Stage 2 offers a one-time grant of INR 25,000 at the age of 18, subject to remaining unmarried and continuing her studies. Small transfers from the age of 13 years take care part of the cost of education and motivates girl children in continuing studies together aiming for the “big prize” that they are supposed to get after crossing 18 years of age. KP-1 encourages enrolment of girl children to educational institutions and KP-2 helps retaining them to schools.

3. Girl Child Enrolment and Other Parameters in West Bengal

It has been found that the KP program was largely effective in increasing enrollment of girl child over the years and in reducing child marriage in West Bengal. Figure-1 and 2 shows steady enhancement of enrolment of girl child in both secondary (Grades IX-X) and higher secondary levels (Grades XI-XII) from 2012-13 onwards validating the positive impact of *Kanyashree Prakalpa*. We see that in session 2012-13 when *Kanyashree Prakalpa* didn't exist, the enrolment rate has been the lowest and gradually it increased thereafter (Mukherjee, 2017). According to data from the National Sample Survey 2014 (NSSO, 2014), the dropout rate from schools among girls in West Bengal has come down. The report says that while the national average for school dropout rate

for girls was 3.23 per cent, the same for West Bengal was recorded 1.28 per cent. In the 2009 survey, the number was higher at 2.34 per cent and that came down in subsequent years. According to U-DISE, 2015-16, the retention rate for girl students in West Bengal increased from 54.14 in the academic year 2013-14 to 56.11 in the academic year 2015-16. For boys, the retention rate remained nearly steady that is 45.20 to 45.03 in the same reference years.

Figure-1: Enrolment Numbers: Secondary Education in Girls in West Bengal



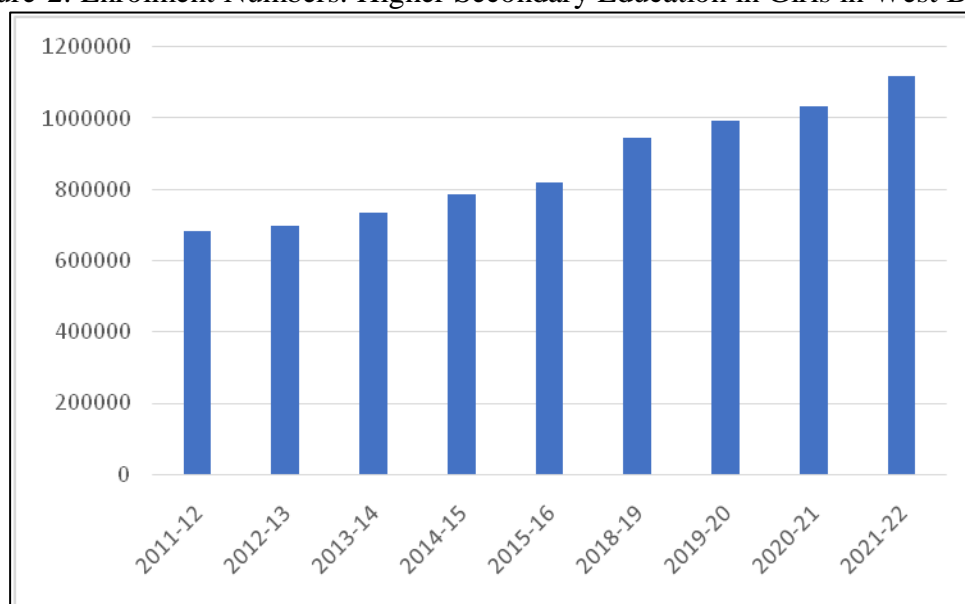
Source: Unified District Information for Education, MHRD, Govt. of India

Studies based on primary survey of the beneficiary girl children of KP scheme also found that the particular scheme had a positive impact on boosting girl children's aspirations and also in reinforcing their parents' desire to educate their daughters (Mukherjee, 2017). Dey and Ghoshal (2018) have empirically found that *Kanyashree Prakalpa* has reduced the probability of child marriages by 6.7 percent and has increased the probability of secondary or higher educational attainment by 6 percent using multiple rounds of NFHS and DLHS data.

Within the first year of implementation, the scheme covered 1,943,403 beneficiaries. In this total the SCs account 23.2 percent, STs 5.7 percent and minorities share 24.3 percent of the total number of beneficiaries. Moreover, the distribution of annual scholarship awarded was approximately proportional to their shares in the population (*'Kanyashree Prakalpa'*: Annual Report 2015-2016). Overall, the *Kanyashree Prakalpa* Scheme turned

out to be one of the most successful schemes for girl children compared to similar schemes launched in different states. This scheme has received widespread recognition at both national and international levels. The scheme has also been appreciated and awarded as the first ranking in the Asia-Pacific group for the category “reaching the poorest and most vulnerable through inclusive services and participation” by the United Nations in July 2017 (Sen and Dutta, 2018).

Figure-2: Enrolment Numbers: Higher Secondary Education in Girls in West Bengal



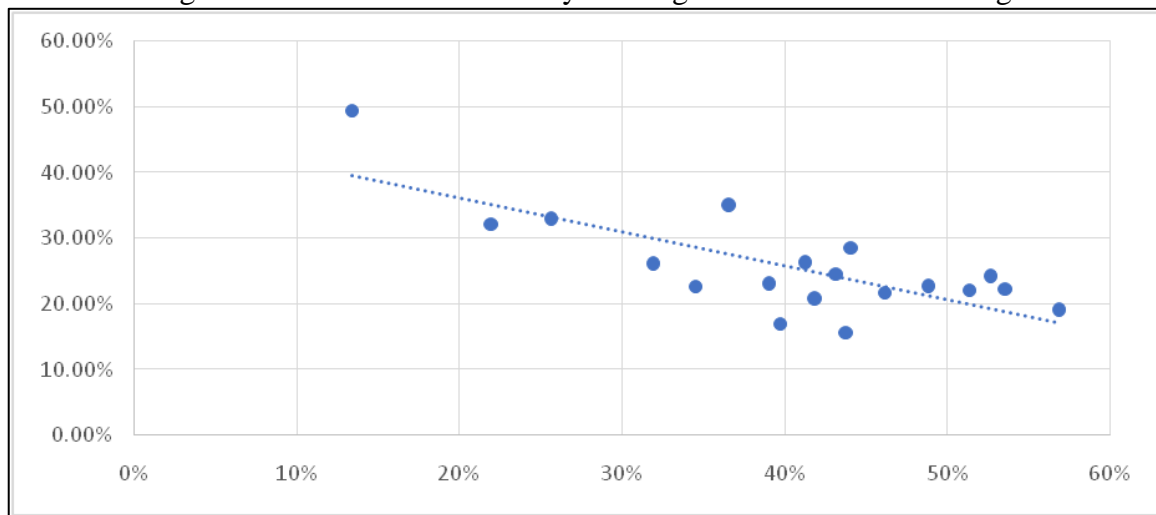
Source: Unified District Information for Education, MHRD, Govt. of India

Further, there are certain other factors that have been assessed which might be indicative of the success of the *Kanyashree Prakalpa*. These include data about early marriages, early pregnancies and years of schooling for women. In Figure 3 we plot percentage of early marriage and percentage of students attending schools in district of West Bengal. It clearly shows a negative relationship indicating that as years of schooling increases the percentage of child marriage declines. However, to ascertain the impact of *Kanyashree Prakalpa* we study three rounds of NFHS covering a time span of 2005-06 to 2019-21 to see how other parameters have changed over time.

Figure 4 shows the trends of early marriage, early pregnancies and women’s schooling over the years of three rounds NFHS-3 (2005-06), NFHS-4 (2015-16) and NFHS-5

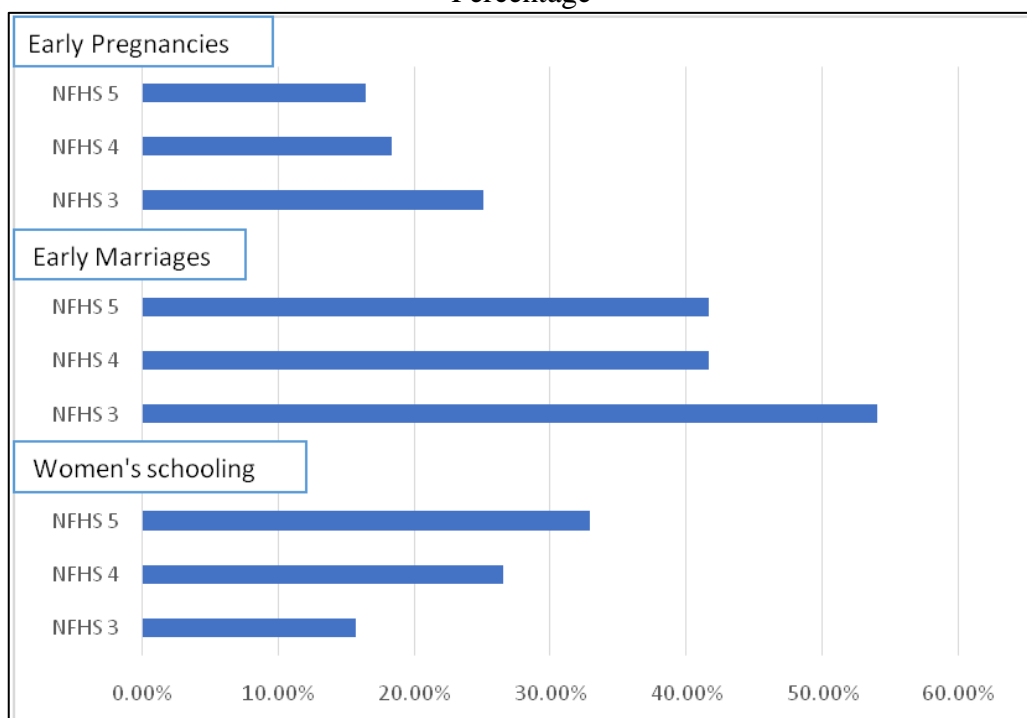
(2019-21). When we look at the women’s years of schooling being equal to or more than 10 years, we see that there has been a substantial rise from NFHS 3 to NFHS 5 which clearly indicates that parents are willing to let their girls persude education at least till the secondary level and further to the higher secondary level.

Figure 3: Relation between Early Marriage and Years of Schooling



Source: NFHS Round 4, Ministry of Health and Family Welfare

Figure 4: Trends of Early Marriages, Early Pregnancies and Women Schooling in Percentage



Source: National Family Health Survey various rounds, Ministry of Health and Family Welfare

The rate of women getting married before 18 years has significantly declined as depicted in the graph which shows how the “big prize” after completing higher education has been an essential incentive to retain them. The number of early pregnancies (15-19 years) has also reduced which also gives a clear indication that the scheme has been successful. In other words, there had been a substantive increase in girl children enrollment in education in West Bengal together with significant decline in child marriage and early pregnancies.

4. Recent Trends in Critical Parameters

A significant increase in enrolment of secondary and higher secondary education in West Bengal has been noted before and after the implementation of the scheme in the previous section. The enrolment trends from 2011 to 2016 (Figure 1 and 2) show a clear rise since the scheme was introduced in 2013. However, when we look at recent data, there is a decline in the enrolment numbers of secondary education from 15,77,967 in 2020-21 to 14,34,448 in 2021-22. This might be because of the after effect of the Covid-19 pandemic and related disruption in normal functioning of schools. Mukherjee, (2023)² writes that the schools were asked to contact each of the dropped-out student and their family members personally and find out whether they have left studies because of loss in household income, loss of parent or due to prolonged closure of schools, long distance between residence and school, unavailability of schools in the neighborhood, engaged in sibling care, domestic chores or due to difficulty in learning or because they have got married, or for any other reason.

When we look at the numbers of enrolment for girls in West Bengal at different time intervals, we get a dismal picture of the scenario, i.e. how many girls have continued schooling vis-à-vis those who have dropped out. A consistent rising trend in enrolment has been found at higher secondary standard continuing in 2018-19. However, computing from U-DISE data, we find that the growth of enrolment during the early years of the scheme i.e., 2011-16 is 20.39 per cent while during the period 2018-19 the growth of enrolment came down to 10.85 per cent. This shows that the drop out has increased in the recent years, more closely during the pandemic specifically at the secondary level. A

² Mukherjee, M. (2023,02,28). Decline in Madhyamik Enrolment: Bengal to Conduct Survey to Identify Dropouts in Govt Schools.

recent fall has been recorded in the number of girls enrolled at the secondary level by -2.72% during the period 2018-19 to 2021-22. Also, the West Bengal government has announced the closure of 8,207 primary and secondary school with fewer than 30 students due to resource crunch (Sarkar, J. & Bhattacharya, A. 2023)³. These schools account roughly 10 per cent of the government controlled primary and secondary schools in the state. This could be one of the reasons of the decline in enrolment. According to a report published in 2018, a particular district- South 24 Parganas had 6,71,255 students studying in fifth to seventh standards in 2011, out of which 90.4 per cent were enrolled in government schools. By 2015, this share had been reduced to 80.56. The total number of students studying in fifth to seventh standards also went down to 5,05,792 in 2015. Therefore, the recent decline in enrollment might be because of closure of government schools in large numbers in the state and that has also reduced the share of students studying in government schools in total number of students enrolled between fifth to eighth standards in the state.

Moreover, comparing the two rounds of National Family Health Survey, namely NFHS-4 and NFHS-5 we find that of out of total 19 districts, 8 districts show a rise in the percentage of early marriages among girl children in NFHS-5 survey (Figure 5). The districts include Bankura, Howrah, Hugli, Koch Bihar, Murshidabad, Kolkata, Paschim Medinipur and Purba Medinipur. The report was published in 2021 of the survey conducted between 2019 and 2021. This possibly indicates the impact of the COVID-19 pandemic in rural households. News articles emphasize the fact that due to financial constraints young girls were married of early in large numbers during the pandemic period as it was a catastrophic shock felt more by the rural households (The Hindu, Business Line, 2022)⁴.

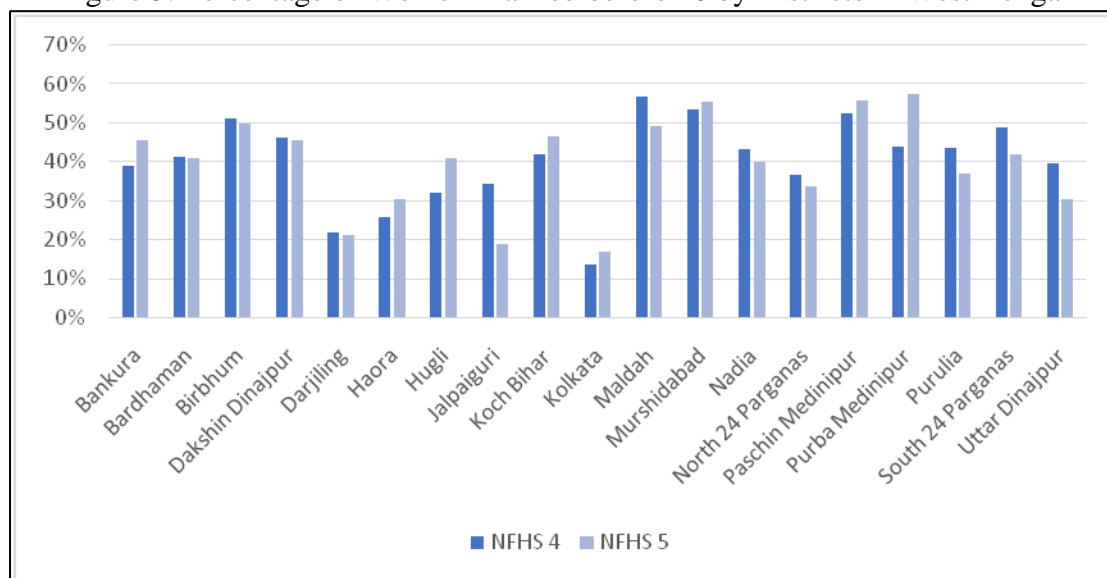
Surprisingly, in all the 19 districts, there has been a growth of women with 10 or more years of schooling during the pandemic period. Figure 5 and 6 indicate that even if the share of women married before the age of 18 increased during recent times due to financial distress but that didn't lead to a decline in the share of women having more than ten years of schooling. This may suggest that due to the financial distress across the

³ Sarkar, J. & Bhattacharya, A. (2023,09,12). Empty Classrooms and Rapidly Closing Schools Spell Doom for Bengal's Children.

⁴ PTI (2022,10,22). Fewer job opportunities reason for early marriage of women in WB, Jharkhand: experts.

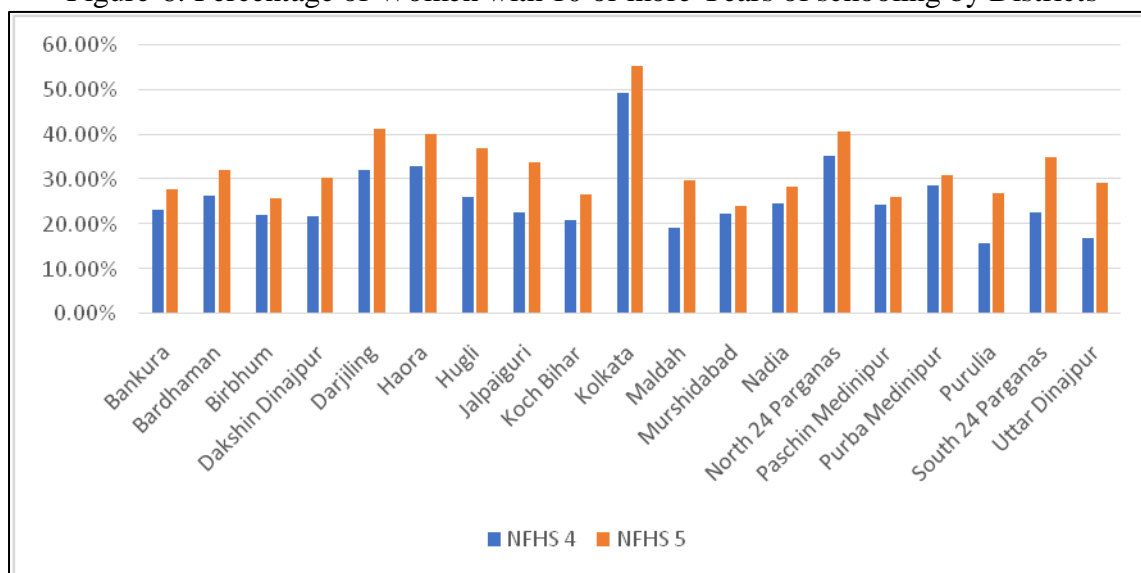
disadvantaged families due to the lockdown, the only string of hope for these families was the *Kanyashree Prakalpa* scheme’s annual grant itself, especially the second part of the scheme i.e., the Rs 25,000 cash transfer to the girl’s account.

Figure 5: Percentage of Women Married before 18 by Districts in West Bengal



Source: NFHS (Round 4 and5), Ministry of Health and Family Welfare

Figure-6: Percentage of Women with 10 or more Years of schooling by Districts



Source: NFHS (Round 4 and 5), Ministry of Health and Family Welfare

This is indicative of the fact that even if girls got married but the families allowed the girls to continue with the school till the higher secondary level. However, in some districts substantial proportion of girls discontinued education or got married before the age of 18 and got excluded from the KP net. Sen and Dutta (2017) analyses district level data of West Bengal which shows that 26 per cent of girls from 14-18 years of age are either dropped out or married in Murshidabad district, 23 per cent in Howrah and 17 per cent in Koch Bihar. Therefore, there might be different factors other than those identified in this paper that condition household's decision on girl children's pursuits of education. Particularly in the face of a catastrophic shock and given the uncertainty that arises out of it, girl's parents take decisions whether to get their children married early or to let them pursue their education. There is a significant effect of the "big prize" even during 2019-2021 during the COVID time, but it is too early to suggest that the scheme could actually sustain itself even during an unprecedented health shock. We can expect more comprehensive results in the 6th round of NFHS.

5. Conclusion

Despite remarkable success in increasing girl child enrolment in West Bengal, the *Kanyashree Prakalpa* has important limitations which perhaps require a closer look. It should not be assumed that the positive results seen in the early years of implementation of the scheme determine a long-term success of the scheme. Areas facing supply constraints in health as well as in education or where the capacity to regulate and control a cash transfer program is limited, should be assessed separately. The positive results not necessarily imply that the program is the best approach to achieve a particular outcome. The additional cash may give the family some financial relief which is expected to encourage more schooling for both genders at least till the secondary level.

It is important to ensure that the money received from the project is actually used for the daughter. In houses where there is strong son preference, parents might just spend the amount for their son's education. In such cases this scheme actually reinforces the son preference and deprives the girl child (Sen and Thamarapani, 2022). Studies also show that even if the enrolment rate has increased, a marked decline in learning skills, especially in basic mathematics has been recorded. This might be a result of an

inadequately developed infrastructure both physical and human which couldn't cope up with the huge surge in enrollments (Das and Sarkhel, 2020). Finally recent trends suggest that child marriage is on the rise in West Bengal. According to the recent NFHS-5 report, it says that 48.1 per cent of girls in West Bengal are married before the age of 18 while the national average is 23.3 per cent. This trend has also been identified by UNFPA-UNICEF Report 2021 which indicates a rise in girl child marriage in West Bengal during COVID-19. Since opportunities for women are limited to a very few and ill-paid jobs, parents often visualise their daughter's future security in marriage rather than on probabilities of getting jobs. Whether the *Kanyashree Prakalpa* would be strong enough to crush this fixed set of cultural believes and inculcate capabilities to a point that parents find pursuing education to be gainful is still a long way to go. This can be ensured only when the benefits of KP scheme and employment opportunities grow together. Also, the small amount offered through the scheme over time might be an insufficient incentive for parents to alter their perception. We can check through marriage records of every district, whether the girl is getting married right after she is 18 years once she received Rs 25,000 after completing higher secondary education. This would indicate that the money had been used up for her wedding rather than higher education. Another option can be that the amount is directly transferred to the university she wants to get enrolled in for her higher education rather than giving money directly in the girl's bank account.

Therefore, undoubtedly *Kanyashree Prakalpa* facilitated education for girl children in West Bengal by way of enhancing enrollment numbers in secondary and higher secondary levels and also it acted positively in containing and reducing child marriage, early pregnancy in the state. But the effectiveness seems to decline over time as government provisioning of school education declines and employment opportunities for girls do not appear to be encouraging in the state. In such a scenario continuing education does not contain child marriage rather parents use the cash received from the scheme as resource for dowry to be used in their child's marriage. Child marriage in that case increases with rising dropout rates and also for students who continue till the higher secondary levels, because marriage becomes the preferred option to parents in periods of uncertainty and shocks and a last resort to secure their girl children's future stability in life.

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Economic Impact of Covid-19 on Indian Economy: Gravity Model Analysis

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Abstract

The Covid-19 pandemic has resulted in a global catastrophe in a shockingly short period of time that severely affected the lives and livelihoods of the people. The health crisis metamorphosed into an economic crisis with contraction in global demand and supply of the commodities. The global health crisis has critical impact on India's health and economy as well. Stringent lockdowns were placed throughout India to contain the Corona virus as a crucial policy response. Resultantly, economic activities almost came to a halt. Since workplaces and manufacturing processes temporarily stopped, the production of goods and services decreased. Supply chains got hugely disturbed. This gave rise to a fall in the aggregate effective demand. These disturbances to the real economy cascaded over to external and financial sectors as well. In this backdrop, this study is an analysis of the economic impact of the pandemic on the Indian economy. The research is grounded on the state-of-the-art augmented gravity model applying the Poisson Pseudo Maximum Likelihood (PPML) technique to capture empirically, the economic outcome of the pandemic on the Indian economy. This study has applied bilateral monthly exports as response variable and number of Corona positive cases & deaths and Free Trade Agreement (FTA) partnership dummies as explanatory variables. The study has used the price indices as an alternative measure for Multilateral Trade Resistance (MTR) which explains the supply and demand impacts of the pandemic on bilateral exports. The findings of this study show that there is a drastic decline in India's exports, GDP, and employment among others because of the global health crisis. The results are significant and have evident policy implications. The study

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recommends increasing public expenditure to restore and increase production capacities, employment opportunities, and invest in physical infrastructure.

Keywords: Covid-19; Pandemic; Exports; Gravity Model; PPML; Multilateral Trade Resistance (MTR)

JEL Classification Codes: F10, F13, F14, I10

1. Introduction

The Corona virus induced pandemic has resulted in a global catastrophe in a startlingly short span of time which severely impacted the lives of the masses and eventually their livelihoods. Covid-19 severely affected the global economy. The pandemic hit the world in the early months of the year 2020. To curb the rapidly spreading Covid infections, it became necessary to impose lockdowns globally. During winters, a second lockdown was also imposed. The economic crisis stimulated by the Covid-19 pandemic was evident by an autonomous and contemporaneous fall in demand and supply globally (Ramakumar and Kanitkar, 2021). The health crisis transformed into an economic crisis with contraction in global demand and supply of commodities other than medicines, health-hygiene & toiletries. Covid-19 generated an economic crisis that affected all the areas of the economy. Drastic disruptions in global supply chains, shutting down of shops, weak demand for non-food commodities and declining production prices have visualized and deepened the cracks in the economic system.

The global health crisis has grave impact on India's health and economy as well. Stringent lockdowns have been placed through India to contain the Corona virus as a crucial policy response. Resultantly, economic activities almost came to a standstill. Since, workplaces and manufacturing processes temporarily stopped, the production of goods and services decreased. Supply chains got hugely disturbed. Simultaneously, the demand side also got affected. Numerous people lost their jobs and livelihoods because of the closing of the commercial entities. This gave rise to a decrease in the aggregate effective demand too.

These disturbances to the real economy cascaded over to external and financial sectors as well. In a nutshell, the pandemic which has started as a health crisis, enlarged into a global economic crisis (Dev and Sengupta, 2020; Beyer, Franco-Bedoya and Galdo, 2020).

This study tries to encapsulate the effect of the Corona pandemic on the Indian economy through exports, gross domestic product (GDP), and employment. The major objective of this study is to understand the economic impact of the pandemic on Indian economy and suggest measures for long term economic growth and development.

The rest of the paper has the following structure. Relevant literature has been reviewed in Section 2. Methodology is discussed in section 3 and data sources in Section 4. Section 5 highlights the findings and analysis. Conclusion of the paper is summed up in section 6.

2. Literature Review

Recent works during pandemic and in the aftermath of the pandemic, estimating the impact of Covid-19 can be classified in mainly two categories. Some studies have analyzed the economy wise impact, while another set of studies have observed the impact at the commodity level or sector wise (Petryle, 2022).

Dev and Sengupta (2020) investigated the likely impact of Covid-19 pandemic on the Indian economy. The financial health of the economy is likely to be hugely disruptive. However, the actual damage to the economy will depend on the severity of the pandemic and might be worse than current estimations. Moreover, it's too early to conclude the impact of the pandemic, the government's role become decisive and effective implementation of the policies are crucial given the severity of the pandemic. Barbate, Gade and Raibagkar (2021) studied the probable short term and the long-term effect of Covid-19 on the Indian economy by adopting a decision-tree² approach for the predictions. Major economic variables are projected to decline sharply during 2020-21 including GDP growth, base lending rate and

² In decision tree approach usually three possibilities are assumed as 'best', 'middle' and 'worst'. Combining values of the three scenarios, probabilities are estimated and expected values are calculated considering equal chance for all the three scenarios.

industrial production index. Unemployment and inflation are likely to increase during the same period. The study concludes that recovery will be dependent on the approach towards recovery -strong, moderate, and weak.

Khorana, Martínez-Zarzoso and Ali (2022) examined the impact of the Corona pandemic on intra Commonwealth³ exports as well as world exports. The research has employed the gravity model for estimating the effects considering the new cases and death by Covid-19. The findings confirm the adverse impact of the pandemic on Commonwealth exports. Zainuddin, Khairuddin, and Hamidi (2022) investigated the impacts of Corona pandemic on bilateral exports of Malaysia in three commodity categories-consumption goods, capital goods and intermediate goods. In case of capital and consumption goods, the increasing number of Corona positive cases in the trading partners of Malaysia resulted in increased bilateral exports. However, in case of capital goods, strict policy stringency index⁴ in the partner country has played significant role in lowering the bilateral exports. Barbero, de Lucio, and Rodríguez-Crespo (2021) explored the effects of Corona pandemic on bilateral exports applying the gravity modelling. The study has included 68 countries exporting to 222 countries based on monthly exports data availability. The observation confirmed that regional trade agreement (RTA) partner countries were affected more negatively on the bilateral trade front. The study also found that government measures negatively affected the trade flows, and it is more severe in situations where exporting and importing nations have similar levels of income. A study by Masood, Ahmed, and Martínez-Zarzoso (2021) assessed the effect of the pandemic on bilateral imports and at the commodity level for fruits and vegetable products applying the structural gravity modelling technique with PPML estimator. The study confirmed the negative effect of Covid-19 for OECD countries on both measures of imports. Davidescu, Popovici, and Strat (2022) examined the trade patterns of Romania with the world and with China employing the gravity model. It is concluded that export from Romania is susceptible to the reduction of demand on the markets of its 12 major European Union partners. Moreover, the effect of the global health crisis has been analyzed by utilizing

³ Commonwealth countries include 56 countries currently, however, at the time of this study 54 countries are part of it.

⁴ The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest).

simulation forecasting situations considering character of the recovery and type of shock spread throughout countries.

Mostly, the studies are limited to either trade or exports and imports in aggregate or at the selected commodities level. Moreover, studies are confined to the world. The study on the impact of the pandemic on Indian economy remains scanty and limited to the potential likely impact of Covid-19. This study is an attempt to fill this gap by encapsulating the real effect of the pandemic on Indian economy.

3. Methodology

The gravity model has been used in this study for estimating the impact of Covid-19 on India’s exports. The gravity modelling employed for economic interactions is homologous to Newton’s law of physical attraction. It states that any two bodies in this universe attract each other, the magnitude of this force is directly associated with the product of their masses and inversely to the square of the distance between their centers. Taking extracts from Newton’s equation for gravitation, Tinbergen (1962) employed Newton’s gravitational concept for forecasting international trade. Mathematically, this force of mutual interaction can be expressed by:

$$X_{ij} = \beta_0 \frac{Y_i^{\beta_1} Y_j^{\beta_2}}{D_{ij}^{\beta_3}} \dots\dots\dots (1)$$

Where,

X_{ij} = Spatial interaction from i to j

β_0 = A constant

Y_i = Size of the variable i

Y_j = Size of the variable j

D_{ij} = Spatial remoteness between Y_i and Y_j

β_1, β_2 and β_3 = coefficients

Log-linear conversion of equation (1), yields equation (2).

$$\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} \dots \dots \dots (2)$$

Here, X_{ij} denotes exports from economy i to economy j , Y_i and Y_j are the GDPs of economies i and j , respectively, D_{ij} is the geographical distance separating economies i and j . β_1, β_2 and β_3 are coefficients that are estimated in the model. The estimated value of β_1 and β_2 are positive, however β_3 will be negative.

The gravity modelling has become empirically tested method for assessing trade, free trade agreements, tariff, custom unions, tourism, and migration. Since the application of gravity model by Tinbergen (1962) and afterward Pöyhönen (1963), it has been extensively used for empirical economic research. Linnemann (1966) has been credited for extending the basic gravity model to explain the patterns of trade. Other economists like Anderson (1979) applied the gravity model for estimating and explaining trade patterns. Bergstrand (1985, 1989) empirically utilized gravity formulation for predicting international trade. The gravity model with extended form including time dimension can be expressed by Equation 3.

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln P_{it} + \beta_4 \ln P_{jt} + \beta_5 \ln D_{ij} + \beta_6 E_{ijt} + \beta_7 Adj_{ij} + \beta_8 CLang_{ij} + \beta_9 FTA_{ijt} + \beta_{10} COVID_{it} + \beta_{11} COVID_{jt} + e_{ijt} \dots \dots \dots (3)$$

Here,

- X_{ijt} = Export from economy i to economy j in time t
- Y_{it} = GDP of economy i in the year t
- Y_{jt} = GDP of economy j in the year t
- P_{it} = Population of economy i in the year t

- P_{jt} = Population of economy j in the year t
- D_{ij} = Distance between capital/major cities of economy i and j
- E_{ijt} = Exchange rate between currencies of economies i and j in year t
- Adj_{ij} = An indicator binary variable called Adjacency having the value of 1/0, in case economies i and j share a common border or not respectively
- $CLang_{ij}$ = An indicator binary variable having the value of 1/0, in case economies i and j having the same official language or not respectively
- FTA_{ijt} = An indicator variable which has binary values 1/0, included to empirically estimate the trade creation and trade diversion between economies i and j (both are partners of the same FTA) respectively in the year t
- $COVID_{it}$ and $COVID_{jt}$ = No. of Covid-19 cases/deaths in the economies i and j respectively, at time t
- β_0 = Slope intercept
- e_{ijt} = Random disturbance term

The ordinary least squares (OLS) approach can be used to estimate the parameters of the gravity model. However, the probable heterogeneity under OLS estimation yields biased coefficient estimates. Likewise, panel data method involves the use of Fixed Effects (FE) or the Random Effects (RE) model for determining the coefficient estimates. Nevertheless, the parameters of the explanatory variables that remain constant cannot be estimated under the FE model. Admitting the fact that trade data includes substantial zero values, and presence of heteroskedasticity, Santos Silva and Tenreyro (2006) suggested using the PPML estimation method. With the purpose of accounting for trade costs, normally distance was used. Subsequently, adjacency, common official language, etc. are also integrated in the underlying gravity model. Anderson (1979) developed the Multilateral Trade Resistance (MTR) approach in the gravity framework. According to Anderson and van Wincoop (2003) using distance, common language, colonial ties, adjacency, etc. are not appropriate substitutes for trade costs. Subsequently, this study has used the monthly Covid cases/deaths as explanatory variables, considering the work by Khorana, Martínez-Zarzoso and Ali (2022), consumer

price index (CPI) has been embodied in the gravity model as a proxy for MTR since the CPI data are available at the monthly basis. The estimated equation using PPML in this study is:

$$X_{ijt} = \exp\{\beta_0 + \beta_1 \ln \text{COVID_NC}_{it} + \beta_2 \ln \text{COVID_NC}_{jt} + \beta_3 \ln \text{COVID_ND}_{it} + \beta_4 \ln \text{COVID_ND}_{jt} + \beta_5 \ln \text{CPI}_{it} + \beta_6 \ln \text{CPI}_{jt} + \beta_7 \text{FTA}_{ijt} + e_{ijt}\} \dots \dots \dots (4)$$

Where,

COVID_NC_{it} = No. of new Covid-19 cases in the economy i, in month t

COVID_NC_{jt} = No. of new Covid-19 cases in the economy j, in month t

COVID_ND_{it} = No. of new Covid-19 deaths in the economy i, in month t

COVID_ND_{jt} = No. of new Covid-19 deaths in the economy j, in month t

4. Data Source

With the purpose of calculating the parameters of the gravity model, 10 largest export partners of India are included. Data on bilateral exports are extracted from the International Monetary Fund (IMF) Direction of Trade Statistics (DOTS). Covid-19 new monthly cases and monthly deaths during April 2020 to March 2021 have been retrieved from the World Health Organization (WHO) Covid-19 dashboard. The author has constructed the FTA indicator variables from the data accessible from the World Trade Organization (WTO) Regional trade Agreements (RTA) Database. Monthly consumer price index (CPI) data has been compiled from FAOSTAT.

5. Results and Analysis

Global economy fell sharply with declining GDP, exports, and imports. Indian economy also witnessed huge decline in GDP and trade. Table 1 implies GDP growth and trade GDP ratio globally and for India. Global GDP growth declined to 3% (negative) in 2020, which was positive prior to the pandemic. During 2020, the GDP growth of India declined sharply to 6.6% (negative). Moreover, trade to GDP ratio also declined to 52.2% globally and 37.8% for India in 2020.

Table 1: GDP Growth Rates and Trade GDP Ratio

Year	GDP Growth (World)*	GDP Growth (India)*	Trade GDP Ratio (World)**	Trade GDP Ratio (India)**
2018	3.6	6.5	57.6	43.6
2019	2.8	3.7	56.3	40.0
2020	-3.0	-6.6	52.2	37.8
2021	6.0	8.7	56.5	45.3
2022	3.1	7.2	63.0	49.0

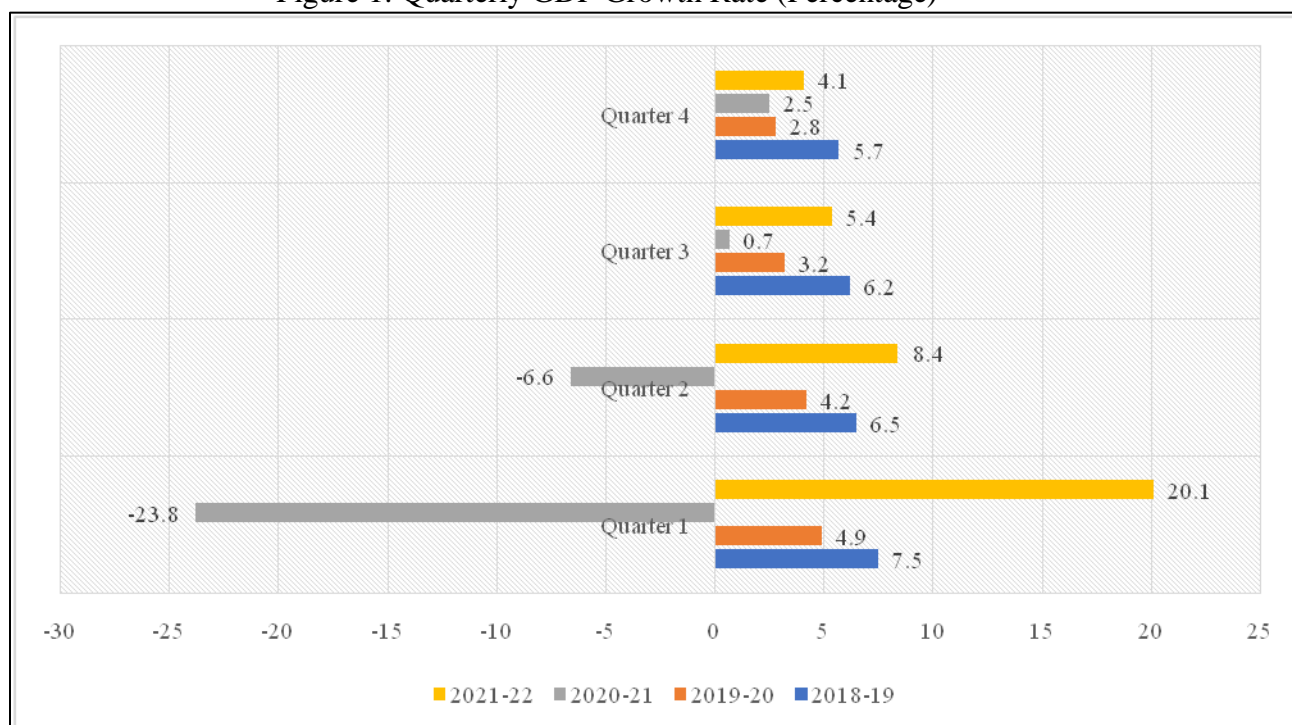
Source: *World Development Indicators (2024); **World Bank (2024)

Quarterly GDP growth and employment scenario of India is shown in Figure 1, Table 2, and Table 3. GDP growth in all the four quarters during 2018-19 to 2021-22 is shown in Figure 1, which clearly visualizes the effect of Covid-19. During the first quarter (Q1) of 2020-21 (April-June 2020), there is a humongous decline in the GDP of India to the tune of (-) 23.8%. Further, during the second quarter (Q2), with some easing, the GDP declined to (-) 6.6%. However, in the third (Q3) and the fourth quarter (Q4), the GDP growth was 0.7% and 2.5% respectively.

The job losses in India were huge during the lockdown period. Unemployment increased during the lockdown to the tune of 20.8 percentage points during April-June 2020 (Table 3). There witnessed a sudden spike in employment demand in rural areas as workers/migrant laborers returned to their villages, which is reflected through Mahatma Gandhi National

Rural Employment Guarantee Act (MGNREGA)⁵ work demanded in Figure 2. During the months of May and June 2020, the demand for MGNREGA work increased to 5.4 and 6.4 crores respectively, which were 2 crores in April 2020. This is due to the job losses to daily/informal/contractual wage earners and factory workers owing to the shutdown of factories/production facilities and lockdown imposed throughout India.

Figure 1: Quarterly GDP Growth Rate (Percentage)



Source: MOSPI (2023)

India's external sector witnessed contraction in connection with the global collapse in demand of many products with exception to certain commodities. Table 4 visualizes the cracks in the trade situation of India, with contraction in exports, imports, and total trade during 2019-20 and 2020-21. Total merchandise exports growth declined to a tune of more than 5% in 2019-20 and around 7% during 2020-21. Similarly, imports declined to 7.6% and

⁵ It is an Indian social welfare scheme which guarantees 'right to work' that provide livelihood security of the households in rural areas by providing at least one hundred days of guaranteed wage employment.

16.9% during the same periods. This decline was reflected in the total trade, which dropped to 6.6% and 12.9% during 2019-20 and 2020-21 respectively.

Table 2: Monthly Urban Unemployment Rate

Month	Unemployment Rate
Jun-19	8.9
Sep-19	8.4
Dec-19	7.9
Mar-20	9.1
Jun-20	20.9
Sep-20	13.3
Dec-20	10.3
Mar-21	9.4
Jun-21	12.7
Sep-21	9.8
Dec-21	8.8
Mar-22	8.2

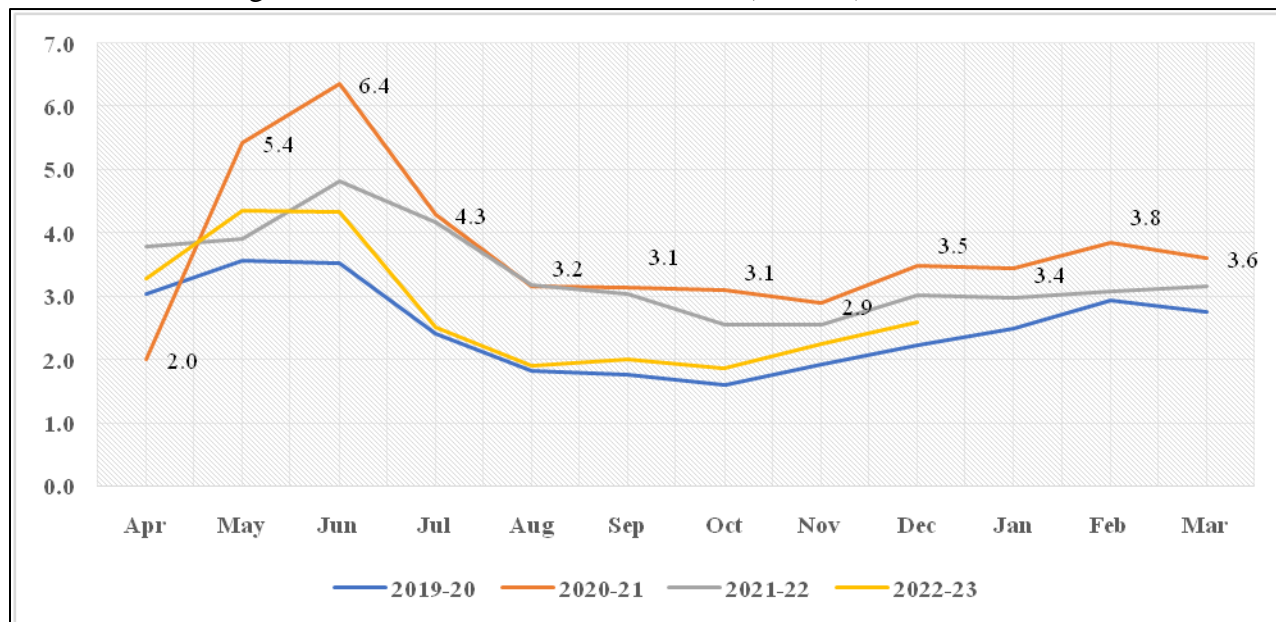
Source: Economic Survey (2022-23)

Table 3: Quarterly Urban Unemployment Rate

Quarters	Unemployment Rate
Jan-Mar 2019	9.2
Apr-Jun 2019	8.8
Jul-Sep 2019	8.3
Oct-Dec 2019	7.8
Jan-Mar 2020	9.1
Apr-Jun 2020	20.8
Jul-Sep 2020	13.2
Oct-Dec 2020	10.3
Jan-Mar 2021	9.3
Apr-Jun 2021	12.6
Jul-Sep 2021	9.8
Oct-Dec 2021	8.7

Source: Economic Survey (2022-23)

Figure 2: MGNREGA Work Demanded (Persons) in Crores



Source: MGNREGA Portal (2023)

Table 4: Trade Growth of India

Year	Total Exports (US \$ Million)	Growth %	Total Imports (US \$ Million)	Growth %	Total Trade [#] (US \$ Million)	Growth % [#]
2017-18	303526.16	10.03	465580.99	21.13	769107.15	16.49
2018-19	330078.09	8.75	514078.42	10.42	844156.51	9.76
2019-20	313361.04	-5.06	474709.28	-7.66	788070.32	-6.64
2020-21	291808.48	-6.88	394435.88	-16.91	686244.36	-12.92
2021-22	422004.40	44.62	613052.05	55.43	1035056.45	50.83
2022-23	451,070.00	6.89	715,968.90	16.79	1167038.90	12.75

Source: Department of Commerce (2024); [#] Author's calculation

Table 5 presents the outcome of estimated parameters of explanatory variables of the gravity model. First, I took into consideration the estimation based on the OLS. To determine

whether or not unobserved heterogeneity pertaining to month and country-pairs guides the results, I also turned to ordinary least squares with fixed effects method. Subsequently, equation 4 is estimated applying PPML method including the month and country-pairs with fixed effects technique. PPML allows for addressing the twin issues of zero trade values as well as heteroskedasticity.

OLS estimates with the likelihood of heteroskedasticity, and unobserved heterogeneity gives biased estimates, PPML method is used. The F-test is performed to validate the likelihood of unobserved heterogeneity for the combined significance of month and country-pair dummies. Thus, country-pair and time fixed effects are included in the benchmark model to check the problem of unobserved heterogeneity. Results with PPML fixed effects show that $COVID_NC_{it}$ coefficient estimate is negative, however, it is insignificant. In addition to, $COVID_NC_{jt}$ coefficient is positive, and it is significant meaning that the exports increased for the destination where there is an increase in the monthly Covid cases. This may be explained on account of the lockdowns and shutdown of the domestic production capacities, but demand for commodities still prevailed. Again, the coefficient estimates for $COVID_ND_{it}$ is negative and significant and for $COVID_ND_{jt}$ is positive and significant. In connection with the shutdown of the local production facilities (spike in monthly Covid deaths) the domestic production of goods declined, however given the demand for certain goods in the destination (partner country), the export from origin to the destination increased with surge in monthly Covid deaths. The parameter estimate of FTA is positive and significant, indicating a surge in bilateral exports from India through its FTA signatory countries during the pandemic. The estimated parameter of the monthly CPI for exporters is negative but not significant; however, the monthly CPI for export destination is positive and significant. R-squared value (0.98) confirms the fit of the model under PPML with fixed effects.

Table 5: Results from Gravity Model

Explanatory Variables	1	2	3
	OLS	OLS with fixed effects	PPML with fixed effects
	(Dependent Variable: lnExports)	(Dependent Variable: lnExports)	(Dependent Variable: Exports)
<i>lnCOVID_NC_{it}</i>	0.2219458 *** (0.0682)	-0.04513*** (0.013618)	-.00854 (.0085636)
<i>lnCOVID_NC_{jt}</i>	-0.0250096 (0.070305)	0.004916 (0.018379)	.0178199** (.0085728)
<i>lnCOVID_ND_{it}</i>	0.0231375 (0.05497)	0.09357*** (0.013807)	-.0150943** (.0067401)
<i>lnCOVID_ND_{jt}</i>	0.2782363*** (0.058858)	0.012027 (0.014461)	.0147495** (.0072399)
<i>lnCPI_{it}</i>	-15.48344*** (0.850504)	4.187823*** (1.079873)	-1.336927 (1.15964)
<i>lnCPI_{jt}</i>	-12.26111*** (0.722109)	5.234743*** (1.081899)	4.401104*** (1.137659)
<i>FTA_{ijt}</i>	2.587152 *** (0.195522)	3.336314*** (0.388271)	2.377373*** (.3138203)
<i>Cons</i>	146.4394*** (5.250953)	-28.35328*** (7.489407)	4.150168 (7.656435)
<i>R-squared</i>	0.3614	0.9885	.98691422
<i>No. of Observations</i>	1318	1318	1318

Note: Standard errors are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1

Source: Author's Estimation

6. Conclusion

This study is an analysis of the economic after effect of the Covid-19 on the Indian economy. Findings of this study established that Indian economy witnessed huge decline in GDP, trade (export and import) and an increase in unemployment with increased demand for local works (MGNREGA). Results from the gravity model show that demand for India's export increased from those partner countries which witnessed surge in monthly Covid cases and deaths during April 2020 to March 2021. This is due to the distortion in the domestic production and thus advanced to greater dependency on import from India. However, India's exports declined (decline in domestic production) with an increase in domestic monthly Covid deaths

(monthly Covid cases are not significant) due to the shutdown of the production facilities domestically.

The study suggests for speedy reviving the Indian economy post-pandemic. This will need huge public spending complemented with private investments. However, the fear of an increase in the fiscal deficit has contained the government in expanding budgetary spending, which escalates the severity of the issue. The study proposes increasing public expenditure to restore and increase production capacities, employment opportunities, and invest in physical infrastructure. This study also recommends investing in human capital and building social infrastructure for sustained growth and development of the Indian economy.

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**Book Review - Doughnut Economics: Seven Ways to Think Like a 21st-
Century Economist**

Author: Kate Raworth

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This book is taken up for review here although it is not a latest entry into the intellectual-market, because of the overwhelming attraction to its non-negotiable ideas of ecological economics over the last five years.

In the contemporary cacophony about inculcating green behaviour to save the world from the impending doomsday, Kate Raworth is a sane economic teacher's voice. She has responded positively to the unrest among intelligent students as to whether they can concretely reach a future rooted in "justice, well-being and ecological resilience". No wonder that student-demand has outstripped supply for her highly sought-after eight-week lectures at the Oxford University's Environmental Change Institute.

In other words, students want a credible answer to the question: What is the safe and just space for humanity to achieve inclusive and sustainable economic development? Kate Raworth's proposition that people in modern societies need to live above decent minimum living standards (social floor), and below the planet's biophysical limits (ecological ceiling) is useful in this regard as it incorporates aspects such as inequality, poverty, and decent work into an understanding of biophysical limits. Social and

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environmental issues are interrelated in the “Doughnut Economy” that meets “the needs of all within the means of the planet”.

Kate Raworth, hailed as a renegade economist, passionately discusses seven mind-shifting commandments in the seven chapters of her book respectively—drops the GDP goal, drop the neoliberal narrative, nurture socially adaptable human nature, embrace dynamic complexity, design to distribute, create to regenerate, and drop growth addiction.

In doing so, she humbly qualifies her viewpoints thus: “These seven ways of thinking...don’t lay out specific policy prescriptions or institutional fixes. They promise no immediate answers for what to do next, and they are not the whole answer. But I am convinced that they are fundamental to the radically different way of thinking about economics that this century demands. Their principles and patterns will equip new economic thinkers—and the inner economist in us all—to start creating an economy that enables everyone in the house to prosper. Given the speed, scale and uncertainty of change that we face in coming years, it would be foolhardy to attempt to prescribe now all the policies and institutions that will be fit for the future: the coming generation of thinkers and doers will be far better placed to experiment and discover what works as the context continually changes.”

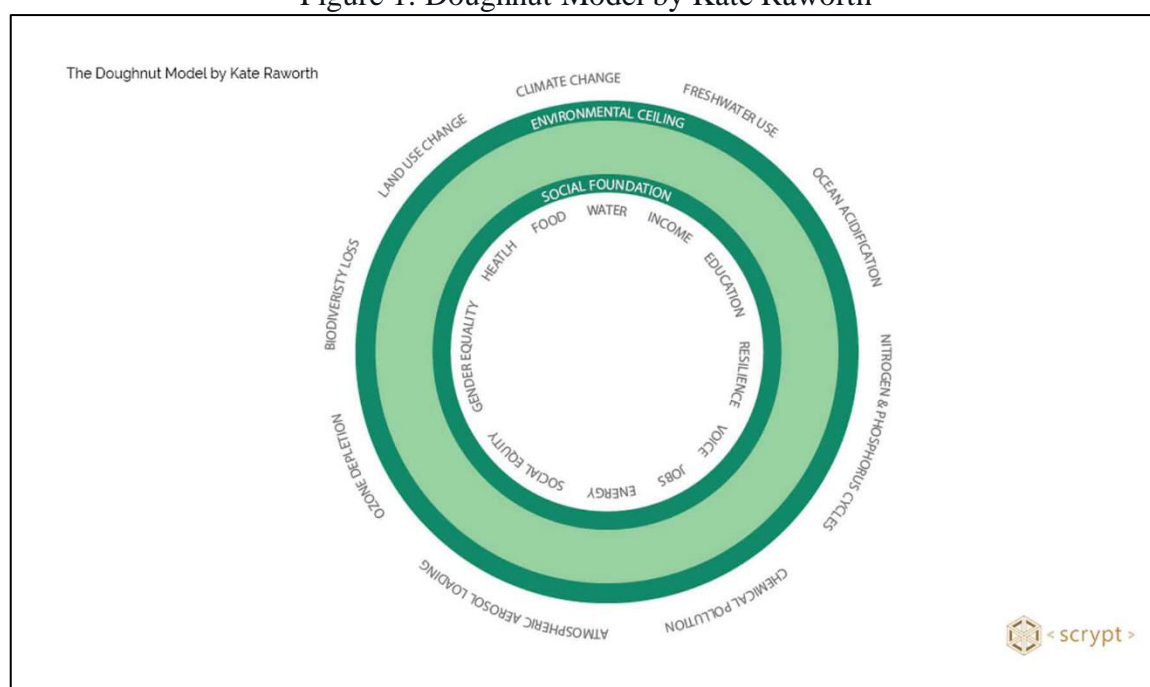
The Introduction and Epilogue of the book titled “Who Wants to Be an Economist” and “We are All Economists Now” respectively are also most interesting. The “Appendix: The Doughnut and Its Data” and the “Notes” reflect the factfulness as also the vast literature underlying Kate Raworth’s erudition.

Kate Raworth’s point of departure is the standard Introductory Macroeconomics that continues to be taught worldwide on the basis of the circular flow of money and goods as the framework for calculating GDP and national income accounts. She objects to it as it abstracts from the current concerns of the environment, social inequality and unpaid care economy that matter for well-being. It does not grapple with whether and how indefinite economic growth can be absolutely decoupled from natural resource use. It bypasses the possibility of how policymakers will be better served by national accounts that focus less on aggregate national production and more on the distribution of income and consumption across households. And it refuses to accept the work of feminist economists which has made clear the importance of bringing the care economy (albeit difficult to

measure) into the heart of macroeconomic thinking and accounting if we are going to create economies and societies that deliver well-being or happiness.

In the alternative economics she proposes, ‘flourishing of life’ should be the social goal, not growth for its own sake. This opens up the framework of judging the performance of an economy by the extent to which the needs of people are met without overshooting Earth’s ecological ceiling. It is rather naïve and irresponsible to teach now that the economy does not have both a biophysical ceiling and an ethico-social floor. There is no point teaching the Keynesian-neoclassical growth synthesis as it violates both of these limits. We need to teach instead that a prosperous economy is the one which meets all the twelve social foundations (water, income, education, resilience, voice, jobs, energy, social equity, gender equality, health and food) without overshooting any of the nine ecological ceilings (climate change, freshwater use, nitrogen and phosphorous cycles, ocean acidification, chemical pollution, atmospheric aerosol loading, ozone depletion, biodiversity loss, and land use change). The model of this economy is diagrammatically portrayed in Figure 1 (Gericke, 2021).

Figure 1: Doughnut Model by Kate Raworth



Source: Gericke (2021)

There are fascinating videos along with TED-talks available on YouTube, which enhance understanding of the issues dealt with in this book: a critique of GDP accounting and the anomalies of treating its growth as a social goal; the vision of the economy as a subsystem of the ecosphere or biosphere, rather than vice-versa; a critique of hyper-rational and selfish economic man; a primer on ‘systems theory’ as a means of dealing with complexity; the need for starting with just distribution instead of leaving it as a post-growth after thought; designing productive processes to be regenerative to the extent possible; and adopting a more agnostic position regarding growth.

There is a problem with this welcome-book, though. The author is not clear about the politics of her economics. Can capitalism save itself from itself? Or, is socialism required to actualise her redemptive economics? There is no “specific analysis of how power operates. When all is said and done, power is a social relationship that inevitably defines the limits of what is possible. At the same time, the possibilities of implementing policies that may look simple on paper move closer or further away. For example, although the need to reduce global meat consumption to combat climate change has been sufficiently documented, it is not easy to find an analysis that also incorporates thinking about how to put such notions into practice. In other words, analysis of the political ecosystem extending to power in its various guises (business lobbies, major production companies, productive system, mass media, political and trade union alliances, and the state itself) is lacking” (Espinosa, 2022).

The World Economic Forum of the super-rich in the world has, for example, accepted Kate Raworth’s analysis but whether the power structure with which the plutocrats of the world thrive, permits implementation of her inclusive policy prescriptions is the moot question.

To conclude, this book is immensely valuable to economics students and teachers who want to skill themselves up for the task of better managing humanity’s shared home in the interests of all. It conveys them the definitive message that economic theories must be actively interwoven with the insights arising in other disciplines such as psychology, ecology, physics, history, Earth-system science, geography, architecture, sociology, and complexity science. And it conveys them a feasible optimistic vision in the backdrop of the extraordinary situation in the economics profession that Kate Raworth has honestly

reckoned with, thus: “No other academic discipline has managed to provide its own students—the very people who have chosen to dedicate years of their life to studying its theories—into worldwide revolt. Their rebellion has made one thing clear: the revolution in economics has indeed begun. Its success depends not only on debunking the old ideas but, more importantly, on bringing forth the new.” All the same, the political framework that facilitates implementation of the alternative economics that Kate Raworth has proposed remains rather vague.

A clear and frank Political Economics, therefore, is the need of the hour. Kate Raworth has acknowledged gratefully that the paradigm-changing work of Herman Daly as the brilliant founding father of ecological economics had “flipped my little econ head inside out and inspired me to write a book on rewriting economics”. But Smith (2010) had challenged Daly thus: “Recent publications have revived interest in Herman Daly’s proposal for a Steady-State Economy. (But)... the idea of a steady-state capitalism is based on untenable assumptions, starting with the assumption that growth is optional rather than built-into capitalism... irresistible and relentless pressures for growth are functions of the day-to-day requirements of capitalist reproduction in a competitive market, incumbent upon all but a few businesses, and that such pressures would prevail in any conceivable capitalism...Professor Daly’s thesis... that capitalist efficiency and resource allocation is the best we can come up with... is misplaced and incompatible with an ecological economy, and therefore it undermines Daly’s own environmental goals... since capitalist growth cannot be stopped, or even slowed, and since the market-driven growth is driving us toward collapse, ecological economists should abandon the fantasy of a steady-state capitalism and get on with the project figuring out what a post-capitalist economic democracy could look like.” To which, there was no reply from Herman Daly till he died on October 28, 2022 much to the sadness of the community of ecological economists in the world.

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Thinking *Bharatiya*, Acting *Vaishwik* in Internationalization of Higher Education

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Abstract

Internationalization of Higher Education (IoHE) is a rapidly emerging zone of transition for visualizing new forms of intercultural communication, collaboration, knowledge creation and dissemination in the present. As a responsible, knowledge-centric society, it is imperative for us to create pathways for not just building Destination Bharat but also to stay connected to our commitment towards realizing our role as a Vishwaguru (a teaching light to the world). This requires that we leverage and shape our pedagogical approaches towards understanding and mainstreaming the inherent Bhartiya Anubhav (Indian experience) in the Vaishwik (global) context. This article throws light on these multiple approaches and explains certain related issues to the Indian context.

Keywords: Internationalization, *Bharatiya Anubhav*, Decolonization, Higher Education

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1. Introduction

Internationalization of Higher Education (IoHE, henceforth) is often confused with globalization and, to some extent; the overlap between the two is justified (Altbach & Knight, 2007). One may ask how else to envision the international creation and communication of knowledge and ideas, if not in a global paradigm of affairs, whether scientific, socio-political, cultural, or educational. However, scholars vary on this as internationalization may be seen as operational with core national aspects and features that are now, through IoHE, being sought to be spread strategically, foregrounding the national advantage (Buckner, 2019). To some extent, thus, IoHE may seem to be emerging as a counter to those aspects of globalization that also culminated in a backlash, often consisting of an assertion of cultural identities against the processes of a cultural leveling of sorts, unevenly mainstreamed through the globalization thesis. A similar critique is available (Altbach, 2004) for the uneven flow and framing of the agenda as well as the knowledge exchange procedures being given effect through the IoHE dominated by the global north in the present. For a hugely diverse country like India, which has now majorly arrived on the global scene of IoHE, possibilities are boundless. This article delves into certain aspects contrasting the economic with the socio-cultural in IoHE, specifically with regard to the advocacy for India's unique role and position on IoHE.

2. The Economic and the Cultural in Internationalization of Higher Education

There can be little doubt that higher education has increasingly been drawn into the game of trade and economic advantage being aggressively played by the major players of the global north (Tokas, 2017). The other half of the world is dealing with the socio-economic and cultural implications of the same, seeing this negotiation of theirs often as a concomitant to the aspirational journey of people as well as the policy agendas drawn at the global scale that meet their expectations. As the ideal of social justice is intertwined with the concept of higher education, and especially so for the developing world, internationalization is also

often seen through this prism. Thus, concerns about equity play a major role in the drafting of policies, e.g. the National Education Policy 2020, in these contexts (UGC, 2021).

Decolonization is another aspect which gains primacy for these countries in the wake of the motto of internationalization being somewhere seen as aligned with new forms of academic imperialism (Bamberger & Morris, 2023). It is imperative for India to consider its options for balancing the economic with the cultural while negotiating its interaction with different models of IoHE. These two sides are also present in the assessment of student choices of institutions, courses, and the preferred components of the curriculum. The motivations vary in accordance with situational factors and related issues, which play a definitive role. Research shows that non-economic factors play an important role in the selection of Destination India by foreign students (Tokas et al., 2022).

3. Intersectionality within Internationalization of Higher Education

Often, it is said that IoHE has a bent towards approaches flowing from the West. This, however, is argued in conjunction with ideas like internationalization at home, which foregrounds the need to align the curriculum, processes, and policies in IoHE towards capacity building in the state-steered institutional framework of higher education (Guri-Rosenblit, 2015). The Indian scenario of higher education is deeply rooted in the statist paradigm and has ideas of valuing inclusion and diversity at its core (Kumar, 2016). The goal becomes to work with intersectional and inclusive approaches that give due weight to race, caste, gender, and ethnicity on various fronts. The built-in capacity to be intersectional is almost synonymous with *Bhartiya Dristhti* (Indian ways of seeing). Thus, internationalization at home must reconcile with intersectionality at home to bring IoHE home. As the optics of IoHE in the West appear to have a homogenized hue (Tight, 2022), this uniquely Indian approach can project Destination *Bharat* in the true light of a *Vishwaguru*. It also has a close connection with promotion of a language-centric model of IoHE.

4. The Language Question in Internationalization of Higher Education

Language is an important ally in visualizing decolonization in a new light. For long, debates in higher education have been around the question of an epistemological departure towards the post-colonial. The idea of a language-centric model is not new in this light. However, to imagine something like IoHE in these terms is indeed worthwhile for overcoming some of the limitations inherent in the confrontationist, post-colonial imagination (Spivak, 2010). This approach is also relatively different when it comes to operationalizing in terms of carving out new modalities of intercultural communication, rooted in IoHE. Thus, promoting the appeal of Indian languages and their expressive depth must be our emphasis. An important dimension in this is the student's voice and identity. Pedagogically speaking, the navigation of an educational sphere is impossible without resolving the language question. If we emphasize the learning of one Indian language alongside the main curriculum design, students will not only develop cross-cultural competence but also be able to build empathy and connection in a much deeper way. Therefore, it can be argued that the *Bhartiyakaran* (Indianization) of higher education's internationalization needs to be conceptualized with the unique linguistic and civilizational appeal which can transform one's *anubhav* (experiential realization).

5. Foregrounding Learn with India: *Bhartiya Anubhav* in Internationalization of Higher Education

India has emerged as a significant player on the international scene of learning, especially in the post-globalization era. Examples of this can be seen in the celebration of Yoga, Ayurveda (especially in the post-Covid days), the rising appeal of Sanskrit and Indian music (The Hindu, 2009), as well as the unique spiritual appeal that the Indian worldview inspires for the inculcation of peace-loving ways of learning and knowledge dissemination. This is a highly sought after quality when it comes to intercultural communication. A lot of celebrated achievers and even common people in the West have looked towards Indian spiritual messages for purposes of finding meaning in their otherwise successful lives. This includes

the likes of Steve Jobs (Economic Times, 2021), Julia Roberts, Richard Gere (My Nation, 2018), and others (Gilbert, 2006). However, it is to be noted that this *anubhav* (realization through experience) needs to be mainstreamed in our IoHE approaches at various levels through conducting detailed research and even short-term studies of student experiences (Tokas and Kumar, 2023). Going further, a new pedagogy of *Bhartiya Anubhav* needs to be evolved to meet this goal. We need more ethnographies and studies rooted in social psychology to understand this advocated path better. However, these studies also need to be seen together with evidence that gives a statistical picture of broad trends and preferences with regard to IoHE.

In conclusion, one can say that the constructive task of building the Indian response to IoHE firstly needs to foreground the deep civilizational learning, and the *Bhartiya* worldview, through a transformative imagination of understanding the *arth* (meaning) of an experiential journey alongside it. Secondly, and more importantly, the idea of Thinking *Bhartiya*, Acting *Vaishwik*, as conceptualized here, speaks of the shift in approach from emulating the West towards imagining a self-reliant, self-aware and a much more rooted approach to IoHE. However, for making strides in this direction the point of departure from the presently dominating modes of doing IoHE has to be seen in theorization of a new cultural semantics of imagining the *Vaishwik* within the *Bhartiya*.

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Is a land restoration boom required in India?

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Abstract

India's forest policy aims to achieve a 33% tree cover nationwide, yet the current tree cover stands at 24.56% as reported in the ISFR 2021 report. As per official sources, a major focus for achieving this target has been put on the Trees outside forest (TOF) regions. Despite witnessing extensive tree planting within short durations, concerns about their sustainability persist. Research has highlighted the dismal failure of such initiatives due to factors such as inadequate maintenance, low survival rates, insufficient study on suitable saplings, and the absence of post-evaluation reports. This paper thereby proposes land restoration companies as a potential solution to assist India in realizing its ambitious targets. Their maintenance ethic is what differentiates them and gives them a comparatively higher success rate. Further, by breaking down the economics behind these companies, the paper tries to prove how they are more cost-effective than initiatives taken up by the government in the long run. Lastly, the research delves into the challenges encountered by such companies, specifically examining funding and land-related issues. The study culminates by proposing measures necessary to bolster a restoration boom in India.

Keywords: Tree plantations, land restoration, forest cover, climate change, SDG

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1. Introduction

Land Restoration is a process of restoring landscapes to sustain humans, wildlife, and plants (“Land restoration”, UNCCD). The process enhances and restores biodiversity and helps mitigate climate change impacts. It includes improving soil and water conditions, increasing tree cover, using fertilizers, and creating sustainable value chains for farmers to harvest organically. This study focuses on processes of land restoration that aim to increase tree cover.

India aims to increase its forest and tree cover to 95 million hectares by 2030 (Government of India 2015, 38), but this is unlikely due to several challenges (Singh 2020, 47). This is because the utilization of land resources encompasses a multifaceted political economy. Within this framework, various stakeholders oversee forest and urban lands earmarked for green endeavors yet encroachments on wastelands persist by the affluent rural and urban populations. Moreover, a dearth of financial resources and bureaucratic impediments further exacerbate these challenges. Finally, institutional capacity inadequacies hinder progress, with local communities granted limited autonomy vis-à-vis the forest department.

According to the India State of Forest Report (ISFR), 2021, the total forest and tree cover of the country stands at 24.62%, which is a 0.28% increase compared to the previous assessment in 2019. With this rate compounded annually, India will need more than 60 years to achieve its commitment of a 33% tree cover. Considering this ambitious target and the current rate of progress, it's important to delve into how India categorizes its tree cover, as this plays a crucial role in the nation's forestation efforts.

Tree cover can be identified under two categories as per Forest Survey of India, Ministry of Environment, Forest and Climate Change (MoEF & CC):

- Forest covers in Recorded Forest Areas (RFAs) and outside RFAs (ORFA)
- Tree cover Outside Forests (TOFs)

The Expert Committee Report by the Ministry of Environment, Forest, and Climate Change emphasizes the need to focus on Tree Outside Forest (TOF) areas due to limited Recorded

Forest Areas(Ministry of Environment, Forest and Climate Change, 2018; Yadav, 2022). Hence, it is clear that India needs massive tree plantation drives to achieve these ambitious targets. These need to be properly executed to ensure a high survival rate. The study thereby objectively tries to construe a comparative been government initiatives and the private sector hence proving why privatization is required in this space and how could it be made possible.

To provide a comprehensive analysis concerning the emergence of such companies/NGOs, this paper is structured in a sequential manner. Section 2 delves into an examination of the current efforts undertaken by the government, along with an assessment of their current performance. Section 3 addresses the complex challenges faced by tree plantations in India, including issues such as unsuitable locations, land disputes, incorrect species selection, community exclusion, fund misappropriation, data inaccuracies, and slow growth rates. Section 4 even though focuses on an in-depth case study of Arunachal Pradesh (AP), a northeastern state, ends up construing valuable insights into the somberness of the overall situation in India as it lies in the region which contributes the most to the overall decline in tree cover within the RFA.

Subsequently, Section 5 undertakes an analysis of the potential benefits that arise from the establishment of land restoration companies, despite their inherent costliness. This section addresses the critical question of why there is a compelling need to establish a dedicated land restoration industry. Through Section 6, the paper delves further into the intricate challenges that impede the effective functioning of land restoration companies. This analysis underscores the essential role these companies can play in helping India achieve its restoration targets. Finally, Section 7 offers a set of recommendations derived from the research findings, providing actionable insights to address the issues discussed throughout the paper.

2. Government efforts so far

The Indian government has undertaken several initiatives to bring the country closer to achieving its aspirations. This section discusses the government's initiatives aimed at restoring land, their implementation, and their current status. Table 1 summarizes the steps.

Table 1: Initiatives taken by Government of India

Name	Description	Current Status
Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)	MGNREGA, since 2005, guarantees rural jobs for 100 days, emphasizing tree planting, water conservation, and land regeneration. Changes in 2014 prioritize 60% of spending on agriculture and allied activities.	Maintenance lapses post 100-day employment hinder tree projects. Audit finds 990 crore incomplete in Punjab. Past 4 years: 5-10% less funds for resource management (Comptroller and Auditor General of India 2023, 168).
Compensatory Afforestation Fund Management and Planning Authority (CAMPA)	CAMPA, created by the Supreme Court in 2009, oversees afforestation funds. Companies redirecting forest land must plant trees elsewhere as compensation, feeding National and State Afforestation Funds (<i>Chapter I – About Compensatory Afforestation in India</i>)	States often have under-utilized funds (“Demand for Grants 2022-23 Analysis: Environment, Forests and Climate Change”, n.d.); Supreme Court mandated central fund pooling via Compensatory Afforestation Fund. Ad-hoc CAMPA funds surged from ₹1200 cr (2006) to ₹23,608 cr (2012).
Green India Mission (GIM)	GIM aims to annually restore 5M ha of trees, enhance 5 Million (M) hectares (ha) of land, and boost forest-based incomes for 3M households. Despite implementation by multiple agencies, results fell short due to various reasons. Only ₹144 crores were spent by 2017-18, covering just 44,000 ha. (Singh, 2020)	Green India Mission combines with MGNREGA, CAMPA, and NAP. Budget 2023 allocates ₹167.28 crores, lower than last year. Sovereign Green Funds cover this allocation. (Ministry of Environment, Forests and Climate Change, n.d.)
National Afforestation Programme (NAP)	NAP is a centrally sponsored scheme aimed at increasing	Recent NAP funds fall short, hindering afforestation goals.

	tree cover in non-forest areas of the country. The programme provides financial assistance to state governments, NGOs, and individuals for afforestation and reforestation activities	Poor coordination left allocated funds unused. In 2021-22, 88% of Mission funds were used (Demand for Grants 2022-23 Analysis: Environment, Forests and Climate Change).
Joint Forest Management (JFM)	JFM involves locals and the government managing forests together for protection and benefits. Committees safeguard forests, get non-timber products, and share wood sales. Aims: restore forests, build community ties, and ease conflicts. Examples: Bishnois, Mundas, Santhals. (Joint Forest Management: A Handbook, 13)	JFM aids forest recovery but faces issues: elite control, uncertain results. As donor funds shrink, and committees fade, JFM work strains resources on a small forest area, posing risks to long-term biodiversity conservation. (Sundar B., 2017, 495)

Source: Authors' compilation

3. Why are tree plantations failing?

One of the major reasons why tree plantations suffer from low success rates is the lack of favorable sites for tree plantations. Rana et al. (2022), pointed towards how during a tree plantation project in Himachal Pradesh, nearly 38% of the allocation was made to places with already a high density of trees. Having to compete for their nutritional needs, the plantations face a reduction in their chances of survival. Out of the \$5.67 million spent on plantations, a significant portion went to non-forest productive areas where environmental conditions act as natural barriers to the growth of trees. Apart from these, 28.9% of the total budget was spent on un-demarcated protected forests. These are forest lands designated for protection but have not been officially marked as protected forests. As they overlap with private or village-owned lands, disputes with local communities often arise, finally affecting the success rate of tree campaigns. (Rana, Fleischman, Ramprasad, & Lee, 2022)

Another reason is the lack of proper research which goes behind deciding which type of species needs to be planted and where. For instance, new eucalyptus trees may effectively

store carbon and are water-intensive crops, but new eucalyptus plantations were established in areas that experience severe droughts.²

Even though the under-utilization of funds has been observed through various aforementioned government programmes, there also have been instances where misuse of funds was reported. CAMPA funds are one such example where a small chunk of the total budget disbursed by the state is spent while the rest is pocketed by the officers. Funds are sought in the name of better quality of soil, soil replacement, better seeds, and fertilizers. In reality, the funds remain unutilized (“Odisha forest officer's arrest puts focus on CAMPA funds' misuse - The Sunday Guardian Live” 2020). Meredith P. Martin et al. (2021) also mention how a lack of consistency in reporting and monitoring leads to embarrassing success rates which directly equates to pecuniary losses.

Data discrepancies also form a factor in causing tree plantations to fail as they mislead the authorities into projects being accomplished. The Supreme Court in 2009 ordered the setting up of a website, e-Greenwatch that provides information about compensatory afforestation projects taken up by the government (Kukreti, 2022). The state forest department has to put information like the location of the site, funds disbursed, and photographs of the work done. However, only one-fourth of the data provided is correct. Extreme cases of data inaccuracy have also been observed. For instance, Bihar's forest department claimed to plant 10,000 trees on account of tree cover loss due to repairing NH57, but the plantation when viewed on Google Earth showed a straight line between India and Nepal. Figure 1 gives the depiction.

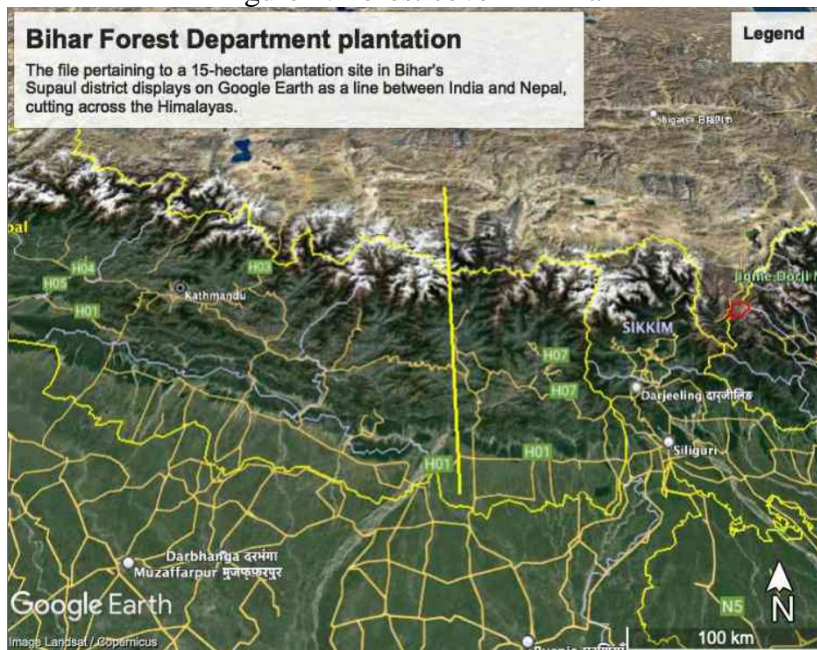
Furthermore, disputes between local communities and authorities also form a reason. Tree campaigns majorly favor monoculture, and more lucrative trees are planted in large numbers. Young teak saplings in the Ambagad Chowki Forest Range were planted by the government, while local communities preferred bamboo plantations and opposed teak plantations. Bamboo can be used locally, while teak is used commercially for furniture. The local

² <https://thewire.in/environment/why-a-government-campaign-to-plant-more-trees-cant-be-a-good-idea-by-default> (accessed in December, 2023)

community's apprehension was that teak trees inhibit the growth of other plants around them due to their dense roots, thereby also disturbing the biodiversity of the area.³

Usually, when a new forest project is approved, the area is fenced off from local communities, which leads to conflicts with the authorities as these communities are highly dependent on these forests for grazing, collecting firewood, and fruits. B. D. Obiri et al. and many other researchers have argued about how the local communities are highly effective and necessary during tree plantation projects through their case studies based out of Ghana. Through their research, it has been proven that involving local communities in tree plantation projects ensures initiatives to remain aligned to their needs, cultural practices, and environmental dynamics. This approach not only enhances the sustainability and success of such projects but also empowers communities to take ownership of their natural resources and improve their overall well-being (Obiri et al., 2011). Hence, local communities must be given a say in the decision-making process as they know the locality better and can be resourceful in making a campaign successful.

Figure 1: Forest cover in Bihar



Source: <https://scroll.in/article/1014823/indias-ghost-plantations-in-which-millions-of-rupees-have-been-sunk> (accessed in December, 2023)

³<https://thewire.in/environment/why-a-government-campaign-to-plant-more-trees-cant-be-a-good-idea-by-default>. (accessed in December, 2023)

Last but the most daunting factor contributing to the perceived failure of tree plantation initiatives pertains to the inadequate pace of implementation. A nuanced examination of the data reveals a nominal increment of merely 5000 square kilometers in the expanse of tree plantations in the past 10 years from 2011-2021 (Appendix: Table A3). Notably, this expansion is predominantly concentrated within two or three states situated in the western and central regions.

Strikingly, the northeastern region of India demonstrates a disconcerting decline in extant forest cover, highlighting the limited efficacy of the tree plantation endeavors in this locale. Accounting for 76% of the total tree cover loss that has happened in the past 20 years, these states have been brought under more scrutiny not just under the ISFR reports but also by various researchers (Potapov et al., 2022). Because the states have the largest tree cover (in percentage terms) with more than 75%, such a decrement in tree cover would implicate impediments in India's growth potential.

Table 2: Tree cover change (in sq. km) in the northeastern states

Year → States ↓	2001	2003	2005	2007	2011	2013	2021	Forest cover change (RFA+ ORFA) (2011-2021)	Tree cover change* (TOF) (2011-2021)
Arunachal Pradesh	68,045	68,019	67,777	67,353	67,410	67,321	66,431	-979	452
Mizoram	17,494	18,430	18,684	19,240	19,117	19,054	17,820	-1,297	254
Meghalaya	15,584	16,839	16,988	17,321	17,275	17,288	17,046	-229	120
Tripura	7,065	8,093	8,155	8,073	7,977	7,866	7,722	-255	44
Nagaland	13,345	13,609	13,719	13,464	13,318	13,044	12,251	-1,067	43
Manipur	16,926	17,219	17,086	17,280	17,090	16,990	16,598	-492	-24

Source: ISFR (2001-2021). *Refer to Appendix: Table A.3

Arunachal Pradesh (AP) evidently gives us insights into the severity of the situation in the northeastern states which contribute the highest to the total fall in tree cover in the RFA across India. Through the table, we can simply see how all the states have been going downhill. To analyze this volatility and have a much deeper look into the northeastern region, we decided to take up AP as the most relevant example.

4. Case study of Arunachal Pradesh (AP)

Taking the example of AP, we see that it had a total loss of 1,614 sq. km with almost all the loss coming from the RFA and ORFA. At the same time, AP also recorded the highest growth of 523 sq. km of tree cover in India (ISFR, 2001-2021) which can directly be credited to the tree cover increase due to plantations in the state, as depicted by the following figures.

Figure 2

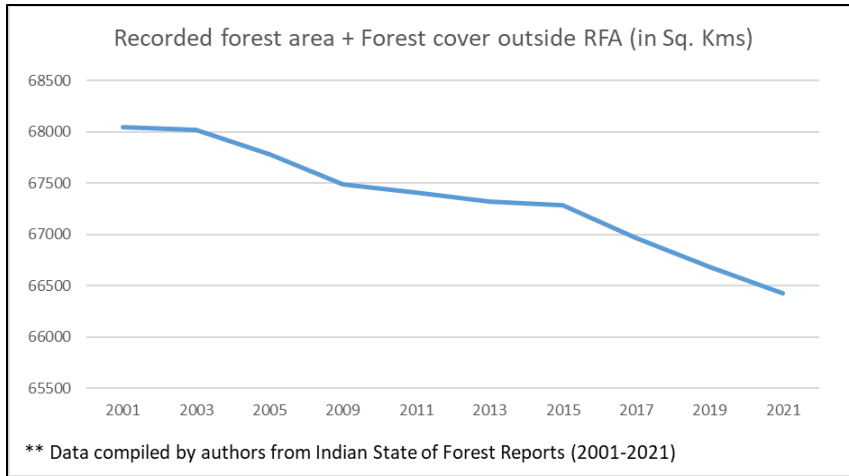
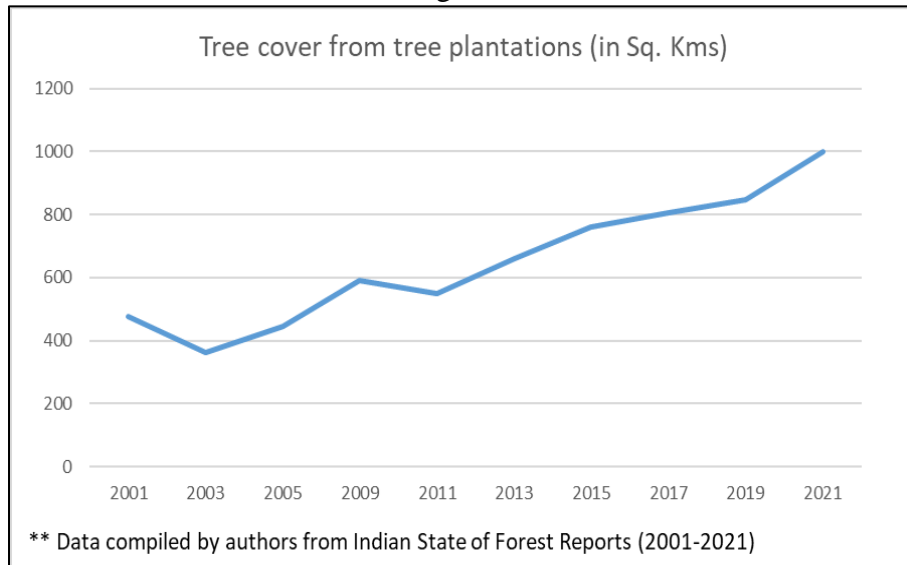


Figure 3



The declining forest covers in Arunachal Pradesh can be attributed to motley of factors but the most significant are as follows:

- Increase in capital expenditure and development across the state

Arunachal Pradesh has been witnessing an increased amount of capital expenditure along with infrastructural development for the past 20 years. North East Special Infrastructure Development Scheme (NESIDS) and the North East Region Textile Promotion Scheme (NERTPS) were implemented to develop the region, and have been allocated more than 221.11 sq. km of forest land in the past 10 years ("The Weather Channel", 2022)⁴. Illegal logging for private development cannot be shown through exact figures but has also been said to be a huge contributor to the loss of tree cover in Arunachal Pradesh.

- Increased demand for timber, shifting cultivation, and expansion of palm oil plantations in Arunachal Pradesh

The expansion of palm oil plantations (Conservation India, n.d), illegal felling of trees for timber, and shifting cultivation have been significant contributors to deforestation in Arunachal Pradesh. Palm oil plantations require vast areas of land, leading to the clearing of forests, which can have severe consequences for the ecosystem and biodiversity (Sagar, H. S. Sathya et al, 2019). Even though cutting trees for timber was banned by the Supreme Court a long time back (T.N Godavarman Thirumulpad against The Union of India, Civil writ petition no 202, 1995), illegal felling of trees for timber, often carried out without proper regulations, has also led to the loss of valuable forest resources. Recently, army personnel seized several truckloads of illegal timber and later handed over to the Deomali forest division. The forest department already had information about the illegal timber mafias but was not keen to take any action. Hence, the army had to intervene to stop illegal timber operations in Arunachal Pradesh. (Roy, 2023)

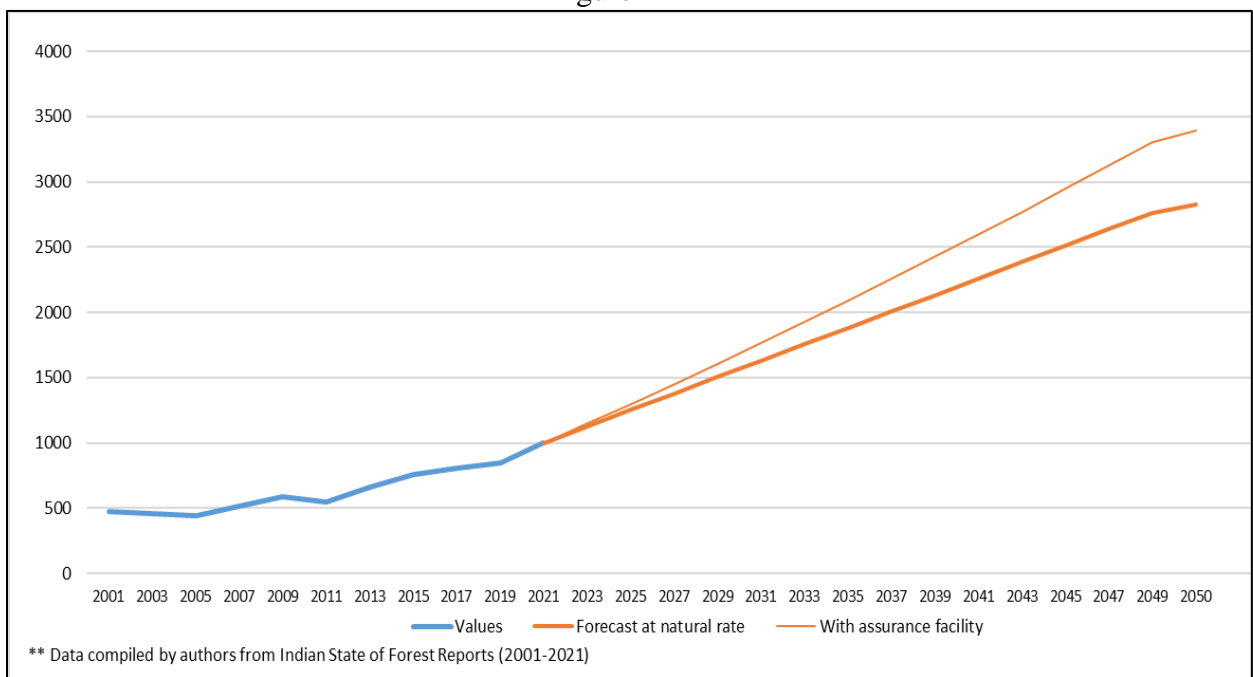
Additionally, shifting cultivation, which involves clearing areas of forest for agricultural purposes, has led to deforestation in many parts of the state (highlighted in ISFR 2019).

⁴<https://weather.com/en-IN/india/biodiversity/news/2022-01-17-arunachal-pradesh-losing-its-primary-forests-at-large-scale> (accessed in December, 2023)

These activities have not only caused significant damage to the environment but have also threatened the livelihoods of local communities which rely on forests for their survival.

At the same time, it also presents us with evidence towards how the tree cover outside the forest regions has been on the rise. This rise can directly be accredited to NGOs like SankalpTaru, Grow Tree “Project purpose”, and other successful afforestation programmes along with Compensatory Afforestation Fund Management and Planning Authority (CAMPA) organized by the forestry department in that state between 2000-2020. If outsourcing the task to land restoration companies is rightly planned with stricter actions taken to improve the forestry department, the growth path for tree cover in Arunachal Pradesh can look as follows:

Figure 4



This would not only replenish the forest cover loss in the past years but would also help the state flourish ecologically and economically. Land restoration companies like SankalpTaru, Say Trees, Acacia Eco, Green Yatra, Project Green Hands, etc. are still emerging and are

very few. They are limited to specific geographical areas only and plan to expand PAN India. Several challenges are also faced while partnering with the government. Hence, initiatives like introducing the land regeneration industry in such a rich atmosphere will not just do wonders but can also lead to a complete reversal of the falling RFA graph with better-planned development initiatives. The ‘With assurance facility’ line depicts an increase of approx. 18% growth rate of tree cover for every tree plantation done through a land restoration company/NGO which will be proven in the next section. (For the exact data regarding the forecast, refer to the Appendix: Table B).

5. Why do we need to set up a land restoration economy?

If we analyze the net growth data from all the countries in Asia, we see Kyrgyzstan and Tajikistan recording net forest area growth of more than 5% and 10% respectively in the past 20 years (*The Global 2000-2020 Land Cover and Land Use Change Dataset Derived From the Landsat Archive: First Results*, 2022). When further analyzed, the pictures become clearer. Both the countries’ economies heavily depend upon these forests as a natural resource and any growth in the tree cover directly means growth to their GDP and provides opportunities for the growing population. Additionally, if we go beyond the scope of central Asia, another such example is Uruguay. Being the only country in South America with a net positive change in tree cover between 2000 and 2020, the tree cover growth can be considered nothing less than a miracle. From being non-existent, the industries that are dependent on forests have increased their share to 3.5% and are predicted to grow the GDP by 2% through their expansion plans. The tree cover growth in this country can hence be directly correlated to the growth of the industry present (Burbano, 2020). This proves one very basic argument i.e. if we need a substantial increase in the tree cover around India, an industry needs to be present around this area and opportunities have to be generated in this sector.

Instead of the government bearing all the burden of improving the tree cover across India, it is much more feasible if this is outsourced to private entities and they are provided with the right incentive to pursue it.

Land Restoration Companies are private firms that generally take up three types of projects:

- Government projects, the government sometimes releases tenders to carry out massive tree plantations in community spaces and nurture green belts.
- Private corporations, land restoration companies take up projects to enhance the aesthetic value of campuses of private corporations.
- Residential and commercial projects, these companies take up projects to develop parks, boundary plantations, and mini forests in lawn areas of residential societies, schools, universities, etc.

These companies use scientific methods like the Miyawaki method. The Miyawaki method was developed by Japanese botanist Akira Miyawaki. The method helps to create a self-sustaining plantation in two to three years while any plantation with traditional methods requires a much greater time to be self-sustaining. In this method, the saplings are closely planted. Since the closely planted trees compete for sunlight, they tend to shoot upwards to catch up most of the sunlight. This process hinders them from growing sideways. 40 to 50 per cent of the plants need to be native species as they will grow faster in the most favorable environment. Plants grow ten times faster when the Miyawaki method is used. (*The Miyawaki Method for Creating Forests – SUGi*)

Land restoration companies have large teams including scientists, researchers, a public relations team, mediators, and both skilled and unskilled execution teams to bridge the gap that exists in India whether it is in the form of species-region mismatch or resolving the maintenance issue that persists in all tree plantation drives.

Plantations by land restoration companies have a greater survival as they use scientific methods, have efficient execution teams, and take up maintenance immensely. While signing a project, the land restoration companies also agreed to deliver a minimum success rate of 85-95% per plantation. Even if the saplings fail, they replace them and ensure that the agreed success rate is delivered. These organizations will not be allotted any project if they do not deliver such a high success rate and hence this “assurance facility” gives them an edge over the government authorities and other local vendors currently working in this field.

The following section presents a cost analysis of government project juxtaposition to the same project if taken up by a land restoration company. This analysis aims to compare the incurred costs and assess the direct tangible benefits associated with engaging a land restoration company. This analysis is motivated by the observed lower success rates in large-scale plantations by government authorities.

Table 3: Cost analysis per 1000 saplings

Initial cost of planting the saplings	₹1,69,104 [^]
Maintenance cost for year 1	₹71,752 [^]
Maintenance cost for year 2	₹65,123 [^]
Maintenance cost for year 3	₹59,488 [^]
Maintenance cost for year 4	₹58,528 [^]
Maintenance cost for year 5	₹57,384 [^]
Total	₹4,81,379 [^]

Source: [Scheme for Diversion of Forest Land for Non-Forestry Purpose in Madhya Pradesh, 2016](#) (accessed in December, 2023). [^]

The prices specified may be subject to fluctuations based on geographic location and annual variations

Similarly, If 1 lakh saplings are planted during a typical plantation drive, the total cost incurred can be approximately ₹5 crores. But because the project is being taken up by the government authorities themselves, it lacks the “assurance facility” that the land restoration companies provide.

Considering a success rate of 60% per plantation drive, the government encounters a minimum loss of ₹2 crores. Land restoration companies though expensive costing 15-20% more than the unprofessional vendors can save up to 50% of this loss i.e. close to ₹1 crores by increasing the success rate to a of minimum 85% (*SankalpTaru*, n.d.; Nirupama, 2016; Gopal, 2021) and also assuring added benefits like high-quality plants and better lifeline (Refer to Appendix 3 for the calculations).

So, for every tree plantation project taken up involving a plantation of 1 Lakh trees, the actual number of trees being planted increases by 25,000 (considering the success rate

improves from 60% to 85%) eventually saving the government crores in expenditure as the amount of such plantations increases.

Even when these tangible benefits are directly available, we believe India will still require a little more time than expected to bring in these necessary changes and establish a land regeneration industry. The next section explains why.

6. Implementation challenges faced by land restoration companies

In India, energy accounts for about 73% of the total greenhouse gas (GHG) emissions, making renewable energy generation a top priority for the country's climate action. Therefore, climate finance in India tends to focus more on the energy sector, and sectors contributing to the remaining 27% of emissions receive less attention (The State of Climate Finance in India, n.d). Land restoration does not get enough focus as agriculture accounts for only 16% of the total carbon emissions. This results in various implementation challenges for land restoration companies, which are discussed in detail in the subsequent part of the paper.

a. Funding

The biggest hurdle for these land restoration companies is securing funding for their projects. Funding can come from government bodies, philanthropic sources, or private finance, but each type of funding presents its own set of challenges. We interviewed Ms. Pooja Shah, one of the core team members of Acacia Eco (Refer to Appendix B), one of the few land restoration companies in India, who explained that getting government projects initially can be tough. Authorities are often hesitant to give projects to these companies, but once they gain confidence in a firm, they are more likely to allot additional projects. When asked about how companies establish their reliability, Ms Pooja Shah stated, “Companies ask authorities for the land and do not take funds from them. They regenerate the land and monitor it for 2-3 years before handing it back over to the authorities. This helps companies build trust with the government, which can lead to more projects being granted.” Government bodies also float tenders under their green schemes, providing land and proper funding. Companies have to compete with each other to win these tenders. Another source of funding is Corporate Social

Responsibility (CSR) funds. However, only a few companies currently support ecological projects through CSR funds, as most funds go towards areas like education and healthcare which can showcase tangible results in a shorter time frame, improving the company's reputation (Ministry of Corporate Affairs, n.d). Land restoration projects, on the other hand, take more than 5 years to demonstrate desired results. However, the trend is changing, with more companies beginning to diversify their CSR funds and providing land restoration companies with a head start. With that being said, land restoration projects are characterized by environmental and social benefits, lacking financial benefits. This discourages private investors from investing in land restoration companies, especially since restoration projects are often too small to attract private investors. Additionally, restoration projects are multi-year projects, and this long time frame can further discourage investment as profits earned in the distant future have a lower value than profits in the near future.

b. Land issues

Obtaining land from government bodies for restoration projects is fraught with bureaucratic challenges. As previously mentioned, authorities are often reluctant to sanction land for these projects. Companies have to seek permission from urban forest authorities, rural forest departments, and local bodies, causing delays in project implementation. In the case of agro forestry projects, companies must educate farmers about how agro forestry can improve soil quality and benefit them. Convincing farmers to support the project can be a difficult task. Disputes with farmers can lead to poor implementation and, ultimately, project failure. Land tenure issues are another implementation challenge in agro forestry projects, as changing ownership of land can prevent farmers from claiming benefits derived from agro forestry (*The Business of Planting Trees: A Growing Investment Opportunity*, 2018, Ghosh et al., 2022).

7. Recommendations

It is certain that the land restoration companies can help India achieve its targets smoothly and quickly. These companies are already flourishing in developed nations and a land restoration economy boom is needed in India.

The government schemes must be implemented through these land restoration companies due to the advantages they bring to the table as pointed out in the paper. Through this process, the companies will get enough funding and hence the restoration economy can prosper. The government must address bureaucratic challenges in the whole process and allow a single clearance window for the projects. Companies must be encouraged to diversify their CSR funds to sectors other than education and healthcare.

The government can launch a portal where these land restoration companies can be listed, and connect these companies with the Ministry of Environment, Forest and Climate Change. This will allow state governments and private corporations taking up land restoration programs to easily locate the 'right' land restoration companies. As various frauds restoration companies are also prevalent as pointed out in the interview conducted with the core member of Acacia Eco.

In conclusion, the need for a significant change in India's forest industry is evident. The achievement of goals set for 2030 is implausible but what lies in front of us right now is if the government can take proactive steps to identify and implement the right methods. The land restoration industry presents a potential solution to the challenges faced by India's forest department. If this industry experiences a boom, what we can guarantee is that it will be able to make better and more achievable promises at international forums, which will help preserve the country's reliability. It is, therefore, essential for the government to become vigilant and take necessary actions to realize the full potential of the land restoration industry and the country's forest resources.

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Appendix 1

TABLE A1: Data representing Arunachal Pradesh's growth of tree cover outside forest area and the decline in forest cover in both Recorded forest areas (RFA) and Trees outside forest (TOF) (in sq. kms)

Years	Type of tree cover	Data
2001	Outside forest area	478
	RFA + TOF	68045
2003	Outside forest area	363
	RFA + TOF	68019
2005	Outside forest area	446
	RFA + TOF	67777
2009	Outside forest area	592
	RFA + TOF	67484
2011	Outside forest area	549
	RFA + TOF	67410
2013	Outside forest area	660
	RFA + TOF	67321
2015	Outside forest area	761
	RFA + TOF	67284
2017	Outside forest area	807
	RFA + TOF	66964
2019	Outside forest area	848
	RFA + TOF	66688
2021	Outside forest area	1001
	RFA + TOF	66431

Source - <https://fsi.nic.in/forest-report-2021-details> (Reports from 2001-2021)

TABLE A2: The Forest cover of India for RFA, ORFA, and TOF (in sq km)

States	2001	2003	2005	2007	2011	2013	2021
Mizoram	17,494	18,430	18,684	19,240	19,117	19,054	17,820
Nagaland	13,345	13,609	13,719	13,464	13,318	13,044	12,251
Arunachal Pradesh	68,045	68,019	67,777	67,353	67,410	67,321	66,431
Manipur	16,926	17,219	17,086	17,280	17,090	16,990	16,598
Tripura	7,065	8,093	8,155	8,073	7,977	7,866	7,722
Meghalaya	15,584	16,839	16,988	17,321	17,275	17,288	17,046
Madhya Pradesh	77,265	76,429	76,013	77,700	77,700	77,522	77,493
Uttarakhand	23,938	24,465	24,442	24,495	24,496	24,508	24,305
Sikkim	3,193	3,262	3,262	3,357	3,359	3,358	3,341
Haryana	1,754	1,517	1,587	1,594	1,608	1,586	1,603
Lakshadweep	27	23	25	26	27	27.06	27.1
Puducherry	36	40	42	44	50	50.06	53.3
Chandigarh	9	15	15	17	17	17.26	22.88
Dadra & Nagar Haveli and Daman& Diu	219	225	221	211	211	213	227.75
Delhi	111	170	176	177	176	179.81	195
A & N Islands	6,930	6,964	6,629	6,662	6,724	6,711	6,744
Goa	2,095	2,156	2,164	2,151	2,219	2,219	2,244
Chhattisgarh	56,448	55,998	55,863	55,870	55,674	55,621	55,717
Punjab	2,432	1,580	1,558	1,664	1,764	1,772	1,847
Maharashtra	47,482	46,865	47,476	50,650	50,646	50,632	50,798
Gujarat	15,152	14,946	14,715	14,620	14,619	14,653	14,926
Uttar Pradesh	13,746	14,118	14,127	14,341	14,338	14,349	14,818
Bihar	5,720	5,558	5,579	6,804	6,845	7,291	7,381
Rajasthan	16,367	15,826	15,850	16,036	16,087	16,086	16,655
Assam	27,714	27,826	27,645	27,692	27,673	27,671	28,312
Jharkhand	22,637	22,716	22,591	22,894	22,977	23,473	23,721
Himachal Pradesh	14,360	14,353	14,369	14,668	14,679	14,683	15,443
Jammu & Kashmir	21,237	21,267	21,273	22,686	22,539	22,538	23,659
Karnataka	36,991	36,449	35,251	36,190	36,194	36,132	38,730
Tamil Nadu	21,482	22,643	23,044	23,338	23,625	23,844	26,419
Odisha	48,838	48,366	48,374	48,855	48,903	50,347	52,156
West Bengal	10,693	12,343	12,413	12,994	12,995	16,805	16,832
Kerala	15,560	15,577	15,595	17,324	17,300	17,922	21,253
Andhra Pradesh + Telangana	44,637	44,419	44,372	45,102	46,389	46,116	50,998
Total	6,75,538	6,78,333	6,77,088	6,90,899	6,92,027	6,97,898	7,13,789

Source - <https://fsi.nic.in/forest-report-2021-details> (Reports from 2001-2021)

TABLE A3: Tree cover for Indian territories (TOF)

State/UT	Tree Cover in Indian States and Union Territories								
	Assessment Year (Area in Sq. Km)								
	2001	2005	2009	2011	2013	2015	2017	2019	2021
Andhra Pradesh and Telangana	9,011	7,640	7,191	7,152	7,187	6,514	6,422	6428	7,617
Arunachal Pradesh	478	446	592	549	660	761	807	848	1001
Assam	1,942	1,484	1,590	1,564	1,582	1,613	1,496	1408	1,630
Bihar	3,693	2,522	2,495	2,369	2,164	2,182	2,263	2003	2,341
Chhattisgarh	3,535	4,492	4,027	3,866	3,463	3,629	3,833	4248	5,355
Delhi	40	107	123	120	118	111	113	129	147
Goa	62	268	286	286	334	325	323	272	244
Gujarat	4,036	7,621	8,390	7,837	8,358	7,914	8,024	6912	5,489
Haryana	1,526	1,565	1,409	1,395	1,282	1,355	1,415	1565	1,425
Himachal Pradesh	397	709	638	623	697	757	822	829	675
Jharkhand	2,694	3,080	3,032	2,914	2,629	2,783	2,922	2657	2,876
Karnataka	7,446	5,467	5,683	5,733	5,920	5,552	5,713	6257	7,494
Kerala	1,146	2,632	2,801	2,755	3,146	2,951	2,959	2936	2,820
Madhya Pradesh	5,751	6,267	6,871	7,090	7,087	7,773	8,073	8339	8,054
Maharashtra	8,269	8,978	9,466	9,079	9,142	9,558	9,831	10806	12,108
Manipur	95	142	197	193	224	243	220	173	169
Meghalaya	140	405	542	578	668	710	657	710	698
Mizoram	95	122	172	190	223	535	467	441	444
Nagaland	70	238	300	322	372	381	379	362	365
Orissa	4,364	4,598	4,435	4,301	4,013	3,986	3,993	4648	5,004
Punjab	1,634	1,823	1,699	1,699	1,499	1,544	1,622	1592	1,138
Rajasthan	5,286	8,379	8,274	8,272	7,860	8,269	8,266	8112	8,733
Sikkim	14	27	20	25	31	35	35	36	39
Tamil Nadu	6,054	5,621	4,968	4,718	4,866	4,505	4,671	4830	4,424
Tripura	68	134	171	184	213	233	215	231	228
Uttar Pradesh	7,545	8,203	7,381	7,382	6,895	7,044	7,442	7342	7,421
Uttarakhand	448	658	665	642	703	752	767	841	1,001
West Bengal	3,264	2,269	2,458	2,335	2,144	2,088	2,136	2006	2,349
A & N Islands	83	53	44	39	41	37	35	41	23
Chandigarh	2	9	11	10	10	9	10	25	15
Dadra & Nagar Haveli + daman and diu	31	36	36	36	36	37	37	32	981
Jammu & Kashmir	2,217	5,633	6,764	6,550	7,664	8,354	7,815	7944	3,511
Lakshadweep	0	4	4	5	5	4	2	0.29	0
Pondicherry	35	42	34	31	29	27	27	23	23
Total	81,472	91,663	92,769	90,844	91,267	92,571	93,815	95027	95,748

Source - <https://fsi.nic.in/forest-report-2021-details> (Reports from 2001-2021)

TABLE B1: Forecasting of the tree cover growth data till 2050 for Arunachal Pradesh with upper bound considering an 18% increase in efficiency of every tree plantation drive executed

Timeline	Values	Forecast at natural rate	With assurance facility*
2001	478		
2003	462		
2005	446		
2007	519		
2009	592		
2011	549		
2013	660		
2015	761		
2017	807		
2019	848		
2021	1001	1001	1001
2023		1126.73	1148.64
2025		1252.68	1296.78
2027		1378.62	1448.89
2029		1504.57	1604.53
2031		1630.52	1763.38
2033		1756.46	1925.14
2035		1882.41	2089.61
2037		2008.35	2256.62
2039		2134.30	2426.01
2041		2260.25	2597.67
2043		2386.19	2771.48
2045		2512.14	2947.35
2047		2638.08	3125.21
2049		2764.03	3304.97
2050		2827.00	3396.46

Source: Authors' compilation. *Assuming minimum success rate of plantations 85% compared to average 60% success rate of government initiatives (Appendix 3)

Appendix 2

An interview was conducted with Ms. Pooja Shah, Core Team Member, Acacia Eco (<https://www.acaciaeco.com/>). Acacia Eco aims to create sustainable urban forests using scientific methods like Miyawaki. Since its inception in March 2016, Acacia Eco has been promoting Miyawaki Forests in urban spaces like schools, factories, green belts, residences, community spaces, etc.

The description of Acacia Eco perfects aligns with our ideal definition of a land restoration company. Hence, an interview was scheduled with one of the core members and the questions covered in the interview are listed below.

1. What are the steps involved in the completion of a project, how a site is selected, and species to be planted? Elaborate on the steps involved in a project.
2. How many years of maintenance a project requires?
3. While partnering with the government, were there any bureaucratic challenges that the company faced? If yes, how does it overcome those challenges?
4. As our research concluded, one of the biggest hurdles in the industry is funding, what are other challenges that the industry faces?
5. Most of the projects by Acacia Eco are concentrated in Gujarat, how the company plans to expand PAN India?
6. How can the government help such an industry to grow?
7. Maintenance is one of the reasons for massive tree plantations. How does Acacia Eco tackle this issue and how it handovers the project after completion?
8. How do you feel about the upcoming future of the land restoration industry?
9. Do you think it is the right solution for India to reach its goal of 33% tree cover by 2030?
10. Have you ever thought about raising funds for your business and expanding it?
11. How do you think a group of students can help this industry grow?

APPENDIX 3

Table C1: Cost analysis of planting 1 Lakh saplings for both land restoration companies and government authorities

Cost incurred by the government authorities	Rs. 5 crores
Number of trees survived based on a success rate of 60%	60,000 out of 1,00,000
Cost per tree	Rs. 833.34
Cost incurred by the government to plant 85,000 trees @ Rs. 833.34	Rs. 7.08 Crores (Approximately)
Cost for the same project taken up by a land restoration company	Rs. 6 Crores (20% additional cost)
Number of trees survived based on a minimum success rate of 85%	85,000 out of 1,00,000
Cost per tree	Rs. 705.88

Source: Authors' compilation

For planting the same amount of trees that land restoration companies do at Rs. 6 crores even after charging 20% extra, the government authorities have to incur approximately Rs. 7 crores. Hence, the approximate costs government authorities save by employing land restoration companies would be approximately Rs. 1 crore for every 85,000 actually planted and maintained (variable to success rates).



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