POPULATION FOUNDATION OF INDIA

EXPLORING LINKAGES BETWEEN WOMEN'S EMPOWERMENT, WORKFORCE PARTICIPATION, AND POPULATION DYNAMICS IN THE INDIAN CONTEXT

A Comprehensive Macro-Micro Analysis

IWWAGE
Institute for What Works to Advance Gender Equality

LEAD LEVERAGING EVIDENCE FOR ACCESS AND DEVELOPMENT
KREA UNIVERSITY

About Population Foundation of India

Founded in 1970 by the late J.R.D. Tata, Population Foundation of India is a leading non-governmental organisation (NGO) working in the field of population dynamics, gender equity, and sexual and reproductive health (SRH). It addresses population issues within the context of empowering women, men, and youth, enabling them to make informed decisions about their fertility, health, and well-being.

The organisation's approaches include strategic engagement with policymakers, media, and other key stakeholders; knowledge generation and dissemination; leveraging technology; scaling up pilot projects; and social and behaviour change communication. Population Foundation of India collaborates closely with and provides technical support to national and state governments, as well as other NGOS.

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Preface

India stands at a pivotal moment in its demographic transition. The country's population landscape captures the sweep of global transformation—declining fertility, widening regional disparities, and the coexistence of both youthful and ageing populations. In many ways, India is a mirror of the world itself: a country where some states still grapple with high fertility and constrained opportunities for women, while others are already navigating the complexities of sub-replacement fertility and an ageing population. This dual reality offers both a warning and an opportunity—an urgent call to shape policies that harness the promise of a youthful nation even as they prepare for the responsibilities of an ageing one.

Gender equality and reproductive autonomy lie at the heart of India's capacity to navigate these demographic transitions effectively. The study, "Exploring Linkages Between Women's Empowerment, Workforce Participation, and Population Dynamics in the Indian Context: A Comprehensive Macro-Micro Analysis," a collaboration between Population Foundation of India and the Initiative for What Works to Advance Women and Girls in the Economy (IWWAGE) at LEAD, Krea University, offers new evidence on these interconnections.

By combining macro-level demographic and human development data with micro-level insights into women's lived experiences, it provides one of the most comprehensive analyses of its kind in India—bridging numbers with narratives to reveal how empowerment shapes the country's demographic and developmental trajectory.

Yet the study underscores an essential truth: women's empowerment does not automatically follow or accompany economic or social progress. Deep-seated structural inequalities, restrictive gender norms, and the limited participation of men in caregiving and reproductive decision-making continue to constrain women's agency and autonomy.

Notably, this study pioneers the development of two composite measures—the Adjusted Human Development Index (AHDI) and the Adjusted Women's Empowerment Index (AWEI) — by adapting the United Nations Development Programme's (UNDP) global Human Development Index (HDI) and the Women's Empowerment Index (WEI), developed jointly by UN Women and UNDP, to India's socio-economic and demographic context. The first-of-its-kind analytical framework for

India captures not just income, education, and health, but also dimensions of agency, decision-making, and reproductive autonomy that are often absent from conventional measures of progress.

The findings reveal striking regional variations across key indicators, such as the Adjusted Human Development Index (AHDI), the Adjusted Women's Empowerment Index (AWEI), and the Total Fertility Rate (TFR). While AHDI and AWEI are strongly positively correlated (r=0.8), both show an inverse relationship with TFR (r=-0.64 and r=-0.5, respectively), underscoring that human development and women's empowerment advance together—and that both are essential for achieving sustainable population outcomes. Yet no Indian state or union territory ranks high on women's empowerment, pointing to enduring social, cultural, and institutional barriers. These patterns call for state-specific strategies tailored to each state's distinct demographic and development profile. Even states and union territories with high HDI scores fall 0.3-0.4 points short of the aspirational target of 1.0, showing that there is still scope to improve human development indicators, even among better-performing states/union territories. The study highlights the need for sustained investment in evidence-based social and behaviour change programs that challenge harmful norms and promote gender equality, positive masculinity, male involvement, and women's empowerment.

Importantly, the evidence shows that when women are educated, exercise reproductive autonomy, and participate in the workforce, societies reap compounding benefits: fertility stabilises, economic productivity rises, and social resilience deepens. Empowerment, therefore, is not a by-product of development; it is its driving force. The study findings indicate that women's workforce participation has a particularly strong positive association with their agency and intra-household bargaining power. As women attain economic independence, they tend to prefer smaller families, balancing time and financial resources more effectively. Yet, the relationship between women's agency and fertility remains complex, especially in settings defined by entrenched patriarchal norms. In contexts with strong son preference, higher fertility can paradoxically correlate with increased maternal agency and intra-household decision-making power. This nuanced dynamic underscores the imperative of addressing deep-rooted social and patriarchal norms to fully realise the transformative potential of enhanced women's empowerment.

At the Population Foundation of India, we have long upheld the conviction that gender equality and human development are inseparable goals. This study reaffirms that belief with robust, data-driven evidence. It offers a clear roadmap for policymakers, researchers, and practitioners to design interventions that are both gender-responsive and demographically informed—ensuring that progress for women and progress for society advance in tandem.

As India stands at the crossroads of demographic opportunity and challenge, its future trajectory will depend on how effectively women's empowerment is placed at the core of development policies. The demographic dividend can be fully realised only when women and girls are enabled to participate equally—in the economy, in public life, and in shaping the choices that define their own futures.

Poonam Muttreja,

Executive Director- Population Foundation of India

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We express our sincere appreciation to all those who contributed to this study and its successful completion.

We extend our gratitude to our research partner, the Institute for What Works to Advance Gender Equality (IWWAGE)—an initiative of the Institute for Financial Management and Research (IFMR) Society—for their rigorous research, analysis, and continuous collaboration throughout the study.

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Last but not least, we extend our heartfelt thanks to the adolescent girls and young women who participated in the study for their time, willingness, and thoughtful responses.

Population Foundation of India

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Acronyms

AHDI	Adaptive Human Development Index
AIC	Akaike Information Criterion
ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AWEI	Adaptive Women Empowerment Index
BIC	Bayesian Information Criterion
CDC	Centers for Disease Control and Prevention
CMRHM	Chief Minister Rural Housing Mission
DDU-GKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
DHS	Demographic and Health Survey
DIKSHA	Digital Infrastructure for Knowledge Sharing
FP	Family Planning
GDP	Gross Domestic Product
GEM	Gender Empowerment Measure
GGPI	Global Gender Parity Index

GII	Gender Inequality Index
GSEM	Generalised Structural Equation Modelling
HDI	Human Development Index
HDR	Human Development Report
ICF	ICF International Inc.
IDI	In-Depth Interviews
IFMR	Institute for Financial Management and Research
IFPRI	International Food Policy Research Institute
IIPS	International Institute for Population Sciences
ILO	International Labour Organisation
IPV	Intimate Partner Violence
IV	Instrumental Variable
LARC	Long-Acting Reversible Contraception
LEB	Life Expectancy at Birth
LFPR	Labour Force Participation Rate
LMIC	Low-and-Middle Income Country
MENA	Middle East and North Africa
MLA	Member of the Legislative Assembly

MMR	Maternal Mortality Ratio
MoSPI	Ministry of Statistics and Programme Implementation
NCT	National Capital Territory
NEET	Not in Education, Employment or Training
NFHS	National Family Health Survey
NHDR	National Human Development Report
NSDP	Net State Domestic Product
NSO	National Statistical Office
NWCS	Nayuma Women's Cooperative Society
OBC	Other Backward Classes
OLS	Ordinary Least Squares
OPHI	Oxford Poverty and Human Development Initiative
PCA	Principal Component Analysis
PLFS	Periodic Labour Force Survey
PMGDISHA	Pradhan Mantri Gramin Digital Saksharta Abhiyan
PMKVY	Pradhan Mantri Kaushal Vikas Yojana

SBC	Social Behaviour Change
SC	Scheduled Caste
SDG	Sustainable Development Goal
SEM	Structural Equation Modelling
SHG	Self Help Groups
SRH	Sexual and Reproductive Health
ST	Scheduled Tribe
SWAYAM	Study Webs of Active Learning for Young Aspiring Minds
SWOP	Status of the World's Population
TFR	Total Fertility Rate
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
W2RT	Women Wizards Rule Tech Program
WEAI	Women's Empowerment in Agriculture Index
WEI	Women's Empowerment Index

EXECUTIVE SUMMARY

BACKGROUND

Women are the architects of a nation's development. Dr. Bhim Rao Ambedkar, a social reformer and the father of the Indian Constitution, once stated, "I measure the progress of a community by the degree of progress which women have achieved." This statement summarises the pivotal role women play in shaping and advancing a nation—socially, culturally, economically, technologically, and philosophically. The idea remains relevant today, as the World Bank estimates that narrowing gender disparities could yield a $172 trillion 'gender dividend' globally. In the Indian context, research suggests that women's economic participation could add ₹35 trillion to India's Gross Domestic Product (GDP) by 2025. Thus, strategic investments in women's health, education, and workforce participation can unlock the potential of an entire generation—capable of advancing both economic growth and social change.

India's demographic shifts reflect global trends, i.e. declining fertility rates, an ageing population, and an expanding youth population, with regional variations. These shifts carry profound gendered implications. The Total Fertility Rate (TFR) has fallen to 2.0, signalling a demographic transition with opportunities and risks. However, this statistical achievement masks underlying inequities (social, economic, and regional). In a country like India, with its significant potential for both demographic and gender dividend, failing to invest in women and girls risks reinforcing vicious cycles of poverty and inequality.

Against this backdrop, Population Foundation of India commissioned this research titled "Exploring Linkages Between Women's Empowerment, Workforce Participation, and Population Dynamics in the Indian Context: A Comprehensive Macro-Micro Analysis" to construct a persuasive, evidence-based narrative advocating for increased investment in women and girls. The study combines macro-level data with individual-level analysis to examine the interlinkages between women's empowerment, workforce participation, and population dynamics, generating critical insights to inform and elevate the policy and programmatic discourse and actions.

METHODOLOGY

At the macro level (i.e., state and union territory levels), we developed two composite indices to measure women's empowerment and human development, drawing on globally accepted methodologies for human development and women's empowerment. The Adaptive Human Development Index (AHDI) builds on the global Human Development Index (HDI) and incorporates child underweight and maternal mortality to better reflect gendered health and wellbeing outcomes in the Indian context. Similarly, the Adaptive Women's Empowerment Index (AWEI) draws from the global Women's Empowerment Index by incorporating context-relevant indicators such as paid work, menstrual hygiene, and political representation in state assemblies.

At the micro level, we used the National Family Health Survey (NFHS-5) data from 2019-21. We used Structural Equation Modelling (SEM) to establish a bidirectional relationship between women's agency, workforce participation, and fertility. To understand the impact of social and cultural norms on women's agency, workforce participation, and fertility, we employed a qualitative approach. We conducted in-depth interviews using vignettes that involved adolescent girls and young women in urban, peri-urban, and rural areas across six districts in Bihar, Uttar Pradesh, and Delhi.

The findings are presented at three levels: (a) macro level, (b) micro level, and (c) qualitative findings, which are discussed in the subsequent section.

SALIENT FINDINGS

1. **At the macro level,** the study highlighted substantial room for improvement in the status of women's empowerment across most Indian states, as evidenced by AWEI. Of the 22 major states, 17 states fall in the 'Medium[i]' AWEI category, and five states fall in the 'Low[ii]' AWEI category. No Indian state or union territory was categorised under the 'High' AWEI category. While the status of human development also falls short of the ideal goal post, as indicated by AHDI, the strong positive correlation (0.8) between the two indices underscores the imperative for policy prioritisation of women's empowerment to enhance human development indicators. The study further identified moderate yet negative

[i] ***Medium category:*** *Goa, Kerala, Tamil Nadu, Himachal Pradesh, Delhi, Chhattisgarh, Punjab, Andhra Pradesh, Telangana, Haryana, Uttarakhand, Odisha, Maharashtra, Gujarat, Karnataka, Rajasthan, and West Bengal*

[ii] ***Low category:*** *Madhya Pradesh, Jharkhand, Uttar Pradesh, Assam, and Bihar*

correlations between the AHDI (-0.64) and AWEI (-0.50) indices and the TFR, suggesting that at a macro level, declining fertility is associated with improvements in both human development and women's empowerment in India.

2. **At the micro level,** to elucidate these interlinkages, an econometric model revealed a bidirectional relationship between fertility and women's empowerment. The findings indicate that while women with more children tend to have greater agency in intra-household decision-making, an increase in women's agency is associated with a decrease in the number of children. However, the impact of higher fertility on women's agency is significantly stronger than the reverse impact. This reflects the complex relationship between women's agency and fertility. Similarly, employed women are significantly more likely to have higher agency compared to those who are not working and tend to prioritise a smaller number of children. While higher workforce participation leads to lower fertility rates, the reverse—lower fertility leading to more workforce participation—is not clearly supported. For married women, having more children increases their chances of working to some extent, likely due to financial needs. Overall, employment and economic independence help women opt for smaller families, but socio-economic pressures often push women, especially those from lower-income backgrounds, into the workforce.

3. **To elucidate the role of gender norms and social barriers,** in-depth interviews were conducted with a limited number of adolescent girls and young women. The interviews provided insight into how these norms significantly restrict women's agency, their bodily autonomy, and their access to modern family planning methods. In most rural and peri-urban areas, young women face pressures to get married at a very early age and have children right after. Patriarchal norms result in disproportionate caregiving responsibilities, restricted mobility, and limited access to social networks, often hindering women's opportunities for higher education and economic empowerment. Social norms continue to reinforce male authority over decisions related to fertility and economic wellbeing. Most of the respondents acknowledged the significance of financial independence in enhancing their agency and reproductive justice. However, challenges such as inadequate access to skill development, limited job opportunities near the place of residence, safety concerns related to travel for work, and poor road connectivity continue to pose obstacles to economic

opportunities in rural and some peri-urban areas. Despite these obstacles, many interviewed young women express a desire for financial independence and autonomy over reproductive choices.

RECOMMENDATIONS

The findings call for stronger fiscal, legislative, policy, and programmatic measures to advance women's empowerment, increase workforce participation, reduce fertility rates, and achieve gender equality.

1. **Strengthen Gender-Responsive Budgeting for Inclusive Development:** Despite the introduction of gender budgeting in 2005–06, the 2025–26 Union Budget reports only 8.86% of total allocations under the gender budget. Only 10 central ministries[iii] allocate more than 30% of their budgets to gender-responsive programmes. These figures signal the urgent need for making gender-responsive budgeting universal and accountable by:
   - Mandating gender budgeting in all states and union territories.
   - Tracking and publicly reporting performances.
   - Creating 'Gender Budgeting Cells' in all the ministries with dedicated staff and training to facilitate the process.
   - Addressing current gaps in capacity, coordination, and accountability will be crucial to ensuring that gender budgeting achieves its intended results.
2. **Advancing Women's Workforce Participation through Skills and Supportive Systems:** The findings show "workforce participation has a strong positive association with women's agency - working women are more than twice as likely to report higher levels of agency compared to those who are not working". Yet, the reverse association is weaker, with higher agency not translating directly into higher employment. Similarly, the qualitative findings indicated that women often acquire traditional skills that do not always translate into meaningful employment. To bridge persistent gender gaps in employment, government

[iii] *Ten ministries are: Ministry of Women & Child Development (81.79%), Department of Rural Development (65.76%), Department of Food & Public Distribution (50.92%), Department of Health & Family Welfare (41.10%), Ministry of New & Renewable Energy (40.89%), Department of Social Justice & Empowerment (39.01%), Department of Higher Education (33.94%), Department of School Education & Literacy (33.67%), Ministry of Home Affairs (33.47%) and Department of Drinking Water & Sanitation (31.50%).*

and industry must collaborate to design skilling programmes that align with market needs and respond to the unique challenges faced by women, especially in informal and rural settings. This includes:

- Providing access to bridge courses.
- Digital and financial literacy training.
- Safe, flexible, conducive work environments, including affordable childcare and paid maternity leave.
- Expanding and evaluating existing schemes like Pradhan Mantri Kaushal Vikas Yojana (PMKVY) to ensure they reach the most marginalised.

3. **Advancing Women's Leadership through Legislative and Programmatic Actions:** The findings reflected that most states scored below 0.5 in the 'Participation in Decision-Making' dimension of AWEI. Women hold 13.6% of seats in the 18th Lok Sabha, 13% in the Rajya Sabha, and 9% in state assemblies. In the judiciary, only 9% of Supreme Court judges and 14% of High Court judges are women. Board representation stands at 28% with limited influence at executive levels. Advancing women's leadership requires going beyond mere representation to addressing structural barriers in both the public and private sectors. This includes:

   - Institutionalised capacity-building, inclusive appointments, strengthening mentorship and promotion pathways, and embedding gender accountability mechanisms.
   - Accelerating the enactment of the Women's Reservation Bill.
   - Focusing on gender-inclusive policies, early mentorship, and accountability.

4. **Strengthening Reproductive Autonomy through Integrated, Gender-Responsive Approaches:** The econometrics analysis shows that for every one-point increase in the agency score, the likelihood of having children decreases by 24%. This suggests that empowered women are more likely to have control over reproductive decisions and access to contraceptives to delay pregnancy, limiting the number of children they want to have. This suggests that advancing reproductive autonomy must be central to both policy and programme design to enable informed, voluntary choices and realise gender equality. This needs to include:

   - Ensuring the provision of a full range of contraceptive choices, quality postpartum care, and safe abortion

services across both public and private health facilities.

- Broadening the scope of Mission Parivar Vikas to include initiatives that promote gender equality in healthcare delivery, with particular focus on sexual and reproductive health and decision-making.
- Reaching excluded groups through last-mile delivery, mobile units.
- Adopting a cross-sectoral approach linking health with empowerment, mobility, and economic security, and embedding these priorities into health planning, financing, and monitoring systems.

5. **Keeping Girls in School: A Strategic Imperative for Gender and Demographic Justice:** The study's findings reflected that on the AWEI education and knowledge dimension, Goa, Himachal Pradesh, and Kerala performed strongly, with higher female secondary education completion rates. Bihar, Madhya Pradesh, and Odisha lag, while high NEET rates highlight barriers to women's education-to-work transition. A key barrier to girls' continued education is the persistence of regressive social norms that devalue girls' education, restrict their mobility, and prioritise early marriage. These socio-cultural expectations, combined with structural barriers, directly undermine retention and completion of secondary schooling. Essential steps recommended to address the barriers are:

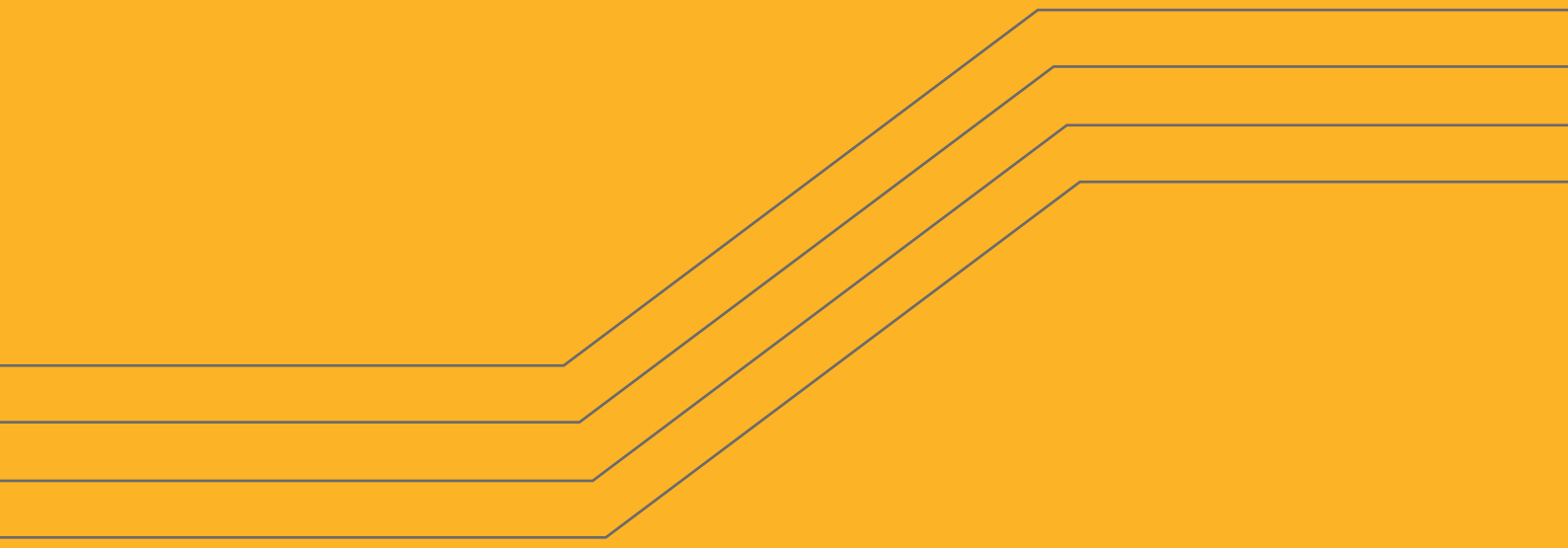
   - Amend the Right to Education Act to extend free and compulsory education up to 18 years of age.
   - Invest in targeted Social Behaviour Change (SBC) campaigns that promote the value of girls' education and challenge gender-biased norms at the community level.
   - Invest in removing practical barriers—such as poor sanitation, lack of menstrual hygiene support, unsafe school transport, and distance to schools—that disproportionately affect girls.

6. **Shift Social Norms Through Innovative Social Behaviour Change (SBC) Strategies:** Social norms across rural and urban contexts place the burden of unpaid care on women and strongly influence reproductive and family planning decisions, limiting women's agency, even in states with high levels of empowerment. Unpaid care work remains a major barrier to women's economic participation, with women performing over 75% of such work globally. Strengthening the care ecosystem is essential to realising women's economic and reproductive potential

across life stages. These need to be addressed by:

- Sustained investment in innovative, evidence-based SBC initiatives to address regressive social norms and promote messages around gender equality, positive masculinity, male engagement, and women's empowerment.
- Expanding investments in the use of digital tools such as AI chatbots, voice assistants, digital learning platforms, and interactive formats to reach young audiences at scale.

7. **Strengthening Data Systems and Evidence-Based Evaluations for Advancing Women's Empowerment:** The study highlights the lack of standardised, longitudinal data on women's empowerment. Strengthening the availability of comprehensive, standardised, and disaggregated data that captures the full spectrum of women's empowerment across time, geography, and other background characteristics is vital for effective policymaking and programme implementation. Key actions to support evidence-based policymaking include:
   - Institutionalisation of periodic data systems, capturing its multidimensional aspects.
   - Promoting third-party evaluations of women-centric programmes for tracking progress, enabling course correction, and informing scale-up.
8. **One Size Does Not Fit All: Tailor Policies and Programmes to State Realities:** The analysis reveals significant sub-national disparities in human development (AHDI), women's empowerment (AWEI), and fertility rates (TFR), along with a strong positive correlation between AHDI and AWEI and moderate negative correlations between AHDI and TFR, as well as AWEI and TFR. These findings underline the critical need for tailored policy and programmatic responses that reflect the unique demographic and development profiles and imperatives of each state and union territory. While low-fertility states need to prioritise maintaining quality sexual and reproductive health (SRH) services and improving elderly care, high-fertility states must focus on basic investments in education and family planning (FP)/SRH services. Also, policy intent alone is insufficient. Progress is often constrained by weak implementation, limited coordination across sectors, and inconsistent follow-through at the state and district levels. Translating national priorities into sustained, context-specific action remains the key challenge and opportunity for policy action.



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BACKGROUND

INTRODUCTION

Investing in women's capabilities and empowering them to make informed choices not only enhances their lives but also drives broader economic growth and human development. While gender equality and women's empowerment are explicitly recognised as standalone goals within the Sustainable Development Goals (Goal 5: Gender Equality), they are instrumental to the achievement of practically all other SDGs, particularly health (SDG 3: Good Health and Wellbeing), education (SDG 4: Quality Education), poverty eradication (SDG 1: No Poverty), economic growth (SDG 8: Decent Work and Economic Growth), peace and justice (SDG 16: Peace, Justice, and Strong Institutions), among others. A recent World Bank Group report estimated a potential $172 trillion 'gender dividend[iv]' by narrowing gender disparities in labour earnings [1].

Thus, prioritising women's opportunities, delaying marriage, and nurturing human capital through investment in women and girls are essential steps towards achieving sustainable development.

However, many socio-economic and cultural factors, alongside structural inequalities, shape women's agency, economic potential, and participation in the workforce, and women's presence in the labour market does not always reflect agency. For many in low-skilled, low-paid work, participation is driven by economic compulsion rather than choice. Thus, ensuring that women's work reflects choice, dignity, and equality remains central to inclusive and sustainable development.

[iv] *A gender dividend is the increased economic growth that could be realised with investments in women and girls. While the demographic dividend comes from shifting age structures toward more productive ages, gender dividends come from taking steps that increase the volume of market (paid) work and the level of productivity of the female population.*

Closing gender gaps is essential not only for achieving the SDGs but also for addressing global socio-economic challenges. In pursuit of building a persuasive evidence-based narrative for greater investments in women and girls, this research aims to examine the interlinkages between women's empowerment, workforce participation, and population dynamics, and to generate critical insights that can inform and elevate policy and programmatic discourse.

CONCEPTUALISING WOMEN'S EMPOWERMENT

Empowerment is described as an expansion of one's ability to make choices in situations where such ability was previously denied to them [2]. This captures two key characteristics of empowerment. First, the process of change from a condition of disempowerment, and second, human agency and choices. Therefore, autonomy, agency, self-direction, liberation, participation, mobilisation, and self-confidence are crucial aspects of empowerment. The dimension of 'agency' separates gender equality from women's empowerment. While there could be improvements in indicators of gender equality over time, it will not be considered as empowerment unless the intervening processes, such as collective actions, power sharing and decision-making, leadership roles, negotiation and voice, control over resources, advocacy and participation, and challenging social norms involve women as agents of that change rather than just recipients [2].

Anderson unbundles women's empowerment across multiple domains—household and society as a whole—through dynamics of norm formation [3]. Women's empowerment at the macro level requires the transformation of all social, economic, and political institutions that function within patriarchal systems [2, 4].

Research suggests a two-way causal relationship between women's empowerment and fertility, with evidence that lower fertility also enhances women's empowerment. In particular, studies have shown that fertility is negatively associated with women's education and employment [5]. Economic independence gives women the freedom to make decisions that affect their lives, including about contraception use and the number of children they wish to have [6, 7]. Several studies have highlighted that women's empowerment is shaped by multiple and interlinked dimensions, including education,

economic autonomy, reproductive rights, decision-making power, and shifts in cultural and social norms [8]. A previously published review of 60 studies identified 19 domains of empowerment, highlighting household decision-making as the most commonly applied measure. The review further noted that, in most studies, empowerment was inversely associated with the number of children. At the same time, several studies reported no significant association between certain indicators of women's empowerment and fertility outcomes [9].

Empowerment operates as both a driver and an outcome of fertility decline, mediated by the availability of socio-economic opportunities and supportive institutional and policy environments. At the same time, evidence points to important paradoxes: declining fertility does not necessarily correspond with higher levels of women's empowerment. Low fertility can coexist with persistent gender inequalities, including restricted mobility, patriarchal control, and high prevalence of gender-based violence.

POPULATION DYNAMICS AND CONTRIBUTING FACTORS

Population dynamics are key to understanding 'how' and 'why' populations change in size and structure over time, and how demographic changes impact resource use, economic growth, and social policies. Multiple interrelated factors shape population dynamics. These include fertility and mortality rates, migration, and broader social and cultural contexts.

Demographic shifts across countries have the potential to reshape gender systems, with implications for women's empowerment that can be both enabling and constraining. A gendered understanding of population dynamics reveals how such shifts affect women's ability to make informed choices about childbirth, contraception, and reproductive health. There are significant differences in fertility patterns worldwide. Countries in sub-Saharan Africa continue to experience high fertility rates, while many parts of East Asia, Europe, and Latin America have seen fertility decline below replacement levels [10, 11]. India presents a mixed picture, with TFR ranging from below 1.5 in southern states, such as Kerala and Tamil Nadu, to above 3 in parts of Uttar Pradesh and Bihar [12]. These variations are largely influenced by differences in women's empowerment indicators, including education levels, access to reproductive

health services, autonomy, labour force participation, and decision-making power. It is therefore essential to assess interlinkages between women's empowerment and fertility within these diverse contexts to better understand how these factors shape outcomes.

Reproductive autonomy is defined as the right of women to choose whether or not to have children, and if so, to determine the number of children, as well as when and with whom; and the freedom to decide on the means and methods of fertility management. It plays a critical role in shaping population trends by determining the timing, spacing, and number of children, ultimately impacting population growth and age structure. For example, when women are denied access to contraceptives, their ability to exercise agency in decisions regarding their reproductive health is constrained. Moreover, limited access to contraceptives heightens the risk of unintended pregnancies, which are associated with increased maternal mortality and adverse health outcomes [13]. Apart from factors such as healthcare, education, and legal rights, women's ability to make autonomous choices is highly influenced by socio-cultural factors that vary across regions [14]. These social and cultural norms surrounding marriage, motherhood, and family planning often determine the extent to which women can make independent, informed decisions about their reproductive lives. These norms can influence whether women can access contraceptive information and services, negotiate the timing and spacing of pregnancies, or seek reproductive healthcare without restrictions. In many contexts, expectations around early marriage, pressure to bear children, or stigma associated with contraceptive use limit women's agency, reducing their capacity to exercise reproductive choices fully. Studies from across low- and middle-income country contexts demonstrate that restrictive gender norms influence preferences and behaviours related to freedom of movement, social interactions, sexuality, fertility practices, family responsibilities and roles, and employment participation and opportunities [15, 16].

Therefore, advancing women's reproductive autonomy requires expanding access to health services and information as well as addressing the social and cultural norms that shape their agency. This will ensure that women everywhere can exercise their rights and contribute fully to sustainable development [17].

WOMEN'S PARTICIPATION IN PAID WORK

Women's economic empowerment refers to both creating market opportunities for women at a policy level and enhancing their ability and capabilities to compete in markets at an individual level [18]. Studies show that women who choose to participate in the formal paid labour force face distinct disadvantages. Even those willing to work often struggle to find employment. This may be because safe and accessible job opportunities for women are limited and concentrated in a few sectors, while men have access to a broader range of options. Women are overrepresented in the informal sector, including agriculture, where their work is often undervalued and poorly remunerated, while industries like construction, trade, and transport remain predominantly male-dominated [19]. Hence, reducing gender barriers and creating opportunities for decent work is fundamental to promoting women's economic empowerment.

Women's economic empowerment can be seen as a process through which women gain greater control over resources, opportunities, and decision-making, not only in relation to their livelihoods but also in shaping broader choices that affect their lives and wellbeing. Upliftment of women's lives through gainful employment also contributes to the overall betterment of their households, communities, and society as a whole. While women's earnings can support families, especially for low-income households, they do not automatically translate into women's economic empowerment. The extent to which paid work enhances women's agency and decision-making varies significantly, shaped by intersecting factors such as the perceived value of women's work, socio-economic status, class, caste, race, and ethnicity. Thus, it is also crucial to explore the nature of work that women can access, especially in developing countries where women tend to be more engaged in precarious work, face relatively higher wage discrimination, and carry a high burden of unpaid care work [20]. Disproportionately high burden of unpaid care work not only limits women's participation in paid employment but also perpetuates the gender pay gap. In the absence of workplace policies such as paid parental leave, flexible working hours, and affordable childcare, many women are either compelled to leave the workforce or accept lower-paying, part-time jobs. These barriers further perpetuate gender inequality in the labour market, constraining women's economic empowerment [21].

A significant proportion of women in developing economies participate in the informal sector and often face higher levels of job insecurity, wage discrimination, and unpaid care burdens, which limit their ability to fully benefit from economic participation [20]. According to the International Labour Organisation's (ILO) 2021 report, 81.8% of employed women in India work in the informal economy [22], and the informal sector employs a larger proportion of women than men [23]. Global research has revealed that gender gaps in education and employment incur significant costs to society, reducing economic growth [24]. The effects were found to be more substantial in regions with relatively higher gender inequality, such as South Asia, the Middle East, and North Africa (MENA), compared to other regions. Globally, it is observed that, unlike men, a considerably large proportion of working-age women neither participate in paid employment nor actively seek employment. The unequal distribution of household and caregiving responsibilities remains a significant challenge, preventing many women from pursuing formal employment.

The low participation of women in the workforce has serious macroeconomic implications. Claudia Goldin's research challenges the assumption of a linear relationship between GDP per capita and women's labour force participation, highlighting a U-shaped relationship between economic growth and women's labour force participation [25]. In poor and rich economies, women's workforce participation is high, but it declines in middle-income countries. This initial decline occurs due to two key factors: the 'income effect', where rising household incomes reduce the necessity for women to work, and the 'stigma effect', where societal norms discourage women from engaging in manual labour. However, as economies transition from manufacturing to service sectors, women's participation rises again due to increased opportunities in white-collar jobs and weakening social stigma. Despite this shift, biological and social constraints, such as career disruptions due to childbirth, continue to hinder women's economic engagement. The widespread availability of birth control in the US allowed women to delay childbirth, invest in higher education, and pursue professional careers, significantly reducing occupational segregation and narrowing the gender wage gap over time.

The following section explores the complex interlinkages between women's empowerment, workforce participation, and population dynamics, analysing how women's empowerment and work participation influence the factors contributing to population dynamics—such as fertility rates, bodily autonomy, and access to reproductive health services—and vice versa.

INTERLINKAGES BETWEEN WOMEN'S EMPOWERMENT, WORKFORCE PARTICIPATION, AND POPULATION DYNAMICS

Women's empowerment is closely related to autonomy over their bodies, access to reproductive health services, and decision-making power within and outside the household, including both the private and public spheres. Without reproductive justice and rights, social and economic rights have only limited power to advance women's wellbeing [26]. In this context, empowerment refers to women's ability to make informed decisions about the number of children they have, the timing and spacing of births, and negotiating for safer sex and contraception usage.

Research across multiple countries has highlighted a negative association between fertility and women's empowerment over the course of demographic transition [9, 27, 28]. Phan highlighted four aspects of women's empowerment that directly affect fertility: women's education, labour force participation, contraception usage, and participation in household decision-making [29]. This relationship is bidirectional– while greater empowerment can reduce fertility, declining fertility can also enhance women's empowerment by freeing up their time and resources and expanding opportunities for education and employment.

Research suggests that when there are fewer children, parents invest in sons and daughters more equally; daughters have equal opportunities in education and employment [30, 31]. Progress in women's education is associated with higher employment prospects and greater labour force participation. These factors can strengthen women's economic autonomy, which, in turn, may improve access to health services and increase contraceptive use [32-35]. Evidence also highlights that women's greater role in household decision-making can enhance their ability to control fertility [36-38]. At the same time, these relationships are neither automatic nor linear. Women's labour force participation and empowerment often evolve in complex and context-specific ways. Social norms around gender roles, family responsibilities, and acceptable forms of work shape how education and employment opportunities translate into

outcomes. In many settings, social norms evolve gradually and interact with economic structures, thereby limiting the immediate impact of rising educational or income levels.

A few studies suggest that fertility decline may lead to increased women's empowerment. Population dynamics, particularly fertility decline driven by informed choices and autonomy, transform the gender system and empower women, resulting in transgenerational impact. While female education plays a key role in reducing fertility rates, the combination of education and gainful employment has a more significant and sustained impact. Women's education increases the chance of employment, and women's employment, in turn, encourages lower fertility [39-41]. However, studies also reflect that the connection between fertility and women's labour force participation varies significantly across income levels and regions; in reality, the relationship is not so straightforward [42]. Women's wage employment is associated with lower TFRs, reduced unmet need for family planning, and higher use of modern contraceptives across major world regions. Evidence, however, also indicates that these patterns are largely observed in non-agricultural employment. The type of work matters: research suggests that jobs in non-agricultural, salaried, or work outside the family are more closely linked to women's financial autonomy, fertility behaviour, and reproductive health outcomes than agricultural or family-based work [43].

Hence, it could be argued that a spiral relationship exists between empowerment, workforce participation, and fertility, as described by Bernhardt (1993) as 'circular cumulative causality', which offers a more nuanced perspective on their interlinkages [44]. The inverse relationship between fertility and women's labour force participation (LFP) does not hold consistently across regions. In sub-Saharan African countries, having more children can increase women's LFP due to financial responsibilities and a lack of income sharing or pooling within households [45]. In contrast, in South Asia, restrictive gender norms limit women's LFP regardless of fertility levels [46].

At the macro level, data show that there is a positive correlation between female illiteracy and total fertility, with countries that have higher rates of illiterate women experiencing higher fertility [47, 48]. A multi-site comparative study examining pathways from education to fertility decline, found that education is associated with delayed age at first birth through increased women's labour-force participation, and that local socio-ecologies also play a significant role in the relationship between education and fertility decline [49]. In the Indian context, the National Family Health Survey (NFHS) round 5 reveals an inverse relationship between education,

wealth status (measured by wealth quintile), and fertility, with the TFR decreasing as the level of education and wealth increase [12]. Women with higher education are also more likely to use modern methods of contraception [48]. In developing countries, studies have found that primary education alone is usually not enough for women to overcome gender constraints—enabling further education or finding alternative opportunities is equally important [50]. In this regard, the level of education, measured by the number of years of schooling completed, is a significant factor. Completion of education should be complemented by opportunities for skill-building, gainful and respectful employment, and an enabling environment that supports a gender-equal society. An earlier Indian study found that women's education and child mortality were the strongest factors explaining fertility differences across the country and over time. In contrast, broader indicators of modernisation and development, such as urbanisation, poverty reduction, and male literacy, showed no significant association with fertility decline [51].

At the country level, women's employment is found to be an important factor at the heart of most explanations of fertility changes, along with the policy environment that enables women to participate in higher education, sports, jobs, and politics [28, 39]. At the individual level, most studies show that women's labour force participation reduces fertility in several ways. Women's employment is considered a key factor in improving women's status, facilitating their capacity to make economic contributions and making them financially independent. Employed women contribute significantly to the household income, thereby creating a substantial impact on the family's overall decision-making process [52]. Women's ability to control their own fertility has been identified as an important enabler of women's labour force participation in various settings [27, 53-56].

Hence, it can be argued that as women's access to quality education and respectful employment opportunities increases, their status, decision-making power, and autonomy in fertility choices are improved. Greater autonomy in fertility choices not only opens the door to higher educational achievement but also improves workforce participation, thereby elevating women's social and economic status.

IMPACT OF SOCIAL NORMS

Gendered social and cultural norms are among the most significant factors hindering women's empowerment, influencing personal and collective behaviours, and shaping institutions, policies, markets, and resource allocation within societies [57]. Consequently, gender norms surrounding choice of livelihoods, domestic responsibilities, mobility, marriage, sexual and reproductive health decisions, and childcare significantly impact women's autonomy and decision-making power.

Patriarchal and social norms significantly influence fertility behaviour and contraceptive usage [58]. Fertility-related norms place expectations on women that undermine their reproductive autonomy. Phan observed two of the most common behavioural traits in Asia and South Africa: a preference for higher fertility, as children are seen as a source of labour supply, especially among low-income families, and a preference for sons [29]. Women tend to have more children to secure their positions in the family. Son preference is often shaped by cultural norms, which further shape contraceptive usage. For example, couples may avoid using contraceptives until they have achieved their desired preference of sons. Though son preference remains a significant factor in fertility decisions, daughter aversion also plays a vital role. A qualitative study in Southern India found that daughter aversion is primarily driven by the perceived economic burden associated with daughters, particularly due to the dowry system. The fear of having multiple daughters frequently outweighs the desire for a son, shaping reproductive choices in unexpected ways. As a result, women employ various methods to influence the sex of their children, with the study highlighting female infanticide as a particularly alarming practice [59].

Similarly, in India, cultural preference for male children has influenced contraceptive choices and contributed to skewed sex ratios. In households with strong son preference, women may have little say in contraceptive use or timing of births, as decisions are influenced by the desire of the husband or family elders to have a male child. Son preference is so deeply embedded that it often results in gender-discriminatory practices, such as sex-selective abortion, infanticide, and even unequal allocation of nutrition and healthcare at the household level [60, 61]. While the implementation of the Pre-Conception and Pre-

Natal Diagnostic Techniques (PCPNDT) Act 1994 has led to some reduction in extreme forms of sex selection, such practices have often shifted underground, and sex selection remains widespread enough to shape reproductive decisions and outcomes. The relationship between legislation, enforcement, and change in social norms is complex and non-linear, with evidence suggesting that legal measures alone have not been sufficient to eliminate the practice. Despite a decline in sex selective abortion, patriarchal norms continue to pressure women until a son is born [62]. Studies reveal that fertility behaviours are both outcomes and determinants of women's status within the household. Reproductive transitions, such as entry into motherhood and adoption of permanent contraception, are often associated with changes in women's agency, including freedom of movement and decision-making power [63]. Traditional fertility norms usually result in a greater likelihood of women getting pregnant and a lower likelihood of delaying pregnancy. There are gendered pathways through which fertility norms influence both men and women. Women often face intense social pressure, while men experience pressure to demonstrate virility. There is also growing evidence on the role of key family members, such as mothers-in-law, and community actors, including Self-Help Groups (SHGs), in influencing women's behaviours and choices regarding family planning [64].

Social norms also significantly impact women's economic empowerment and decision-making power. Patriarchal norms have traditionally assigned care responsibilities and household chores to women, a task that becomes more complex with higher fertility rates [65]. This "female homemaker, male breadwinner" model is deeply entrenched, often resulting in women withdrawing from employment after marriage or childbirth. The pressures of balancing childrearing and employment usually confine women to the informal sector, where they face insecure work arrangements and also lack important safeguards regarding working conditions and job security. Employers often presume that women's productivity is affected by care responsibilities, which can limit their economic opportunities [57].

In India, according to the Periodic Labour Force Survey (PLFS) 2022-23, 46% of women aged 15-59 years were fully engaged in domestic duties, with 85% of them citing childcare and homemaking as the primary reasons for not seeking income-earning opportunities. Norms also contribute to occupational segregation, with women disproportionately concentrated in low-productivity sectors such as agriculture, informal work, or as unpaid helpers in family

enterprises. In contrast, the formal and white-collar sectors remain male-dominated.

Additionally, restrictions on mobility further limit women's ability to seek or maintain jobs, as many have to rely on permission from husbands or in-laws to leave the house. Stigma surrounding women's paid work, particularly outside the home, continues even among higher-status families, where female employment is perceived as a sign of lower social standing or economic distress. Norms of daughter aversion perpetuaate the deprioritisation of investment in girls' education, focusing instead on sons, who are viewed as a future source of financial support. This leaves women less prepared for the job market.

Therefore, addressing discriminatory gendered social norms can positively contribute to women's empowerment. Interventions aimed at changing societal perceptions of women's roles need to be sustained over the long term, as these norms are often deeply ingrained.

RESEARCH RATIONALE AND OBJECTIVES

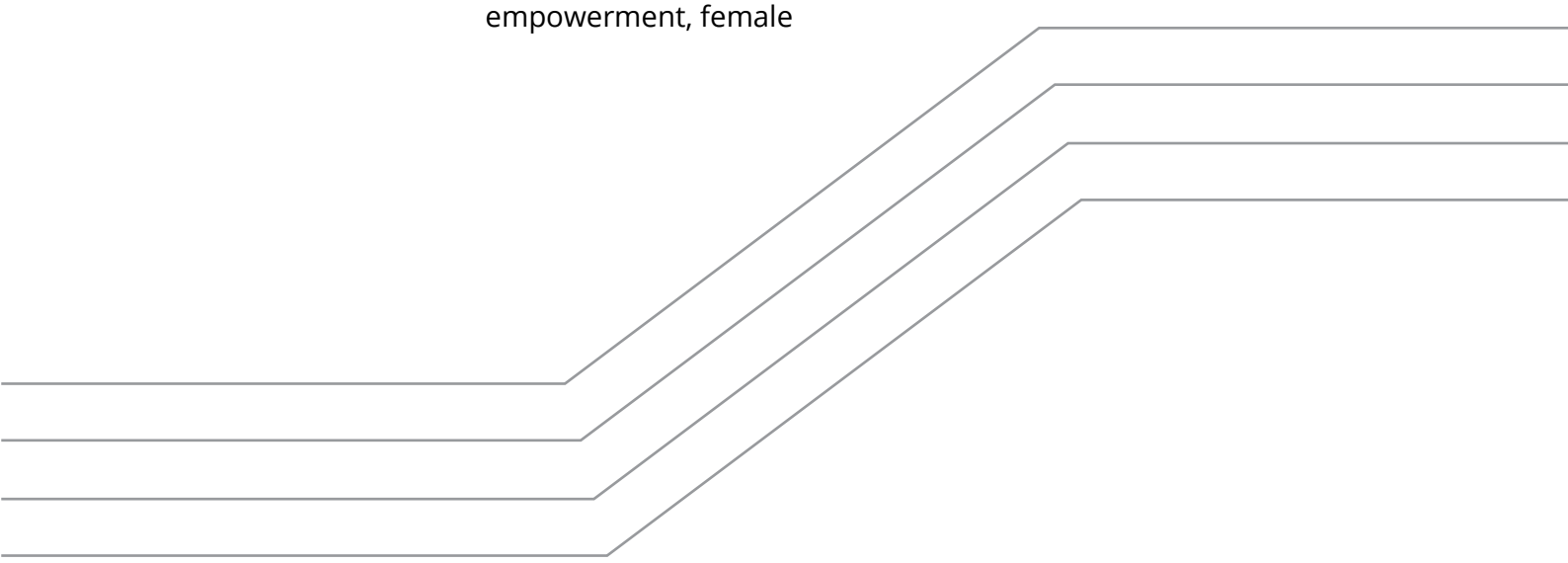
Women's empowerment is recognised as a multidimensional construct encompassing social, economic, and political dimensions. While extensive research has examined these aspects, integrated analysis of the interlinkages between empowerment, workforce participation, and population dynamics at both macro and micro levels remains limited. At the core of these interlinkages is women's agency (intrinsic, instrumental, and collective), which connects demographic change with socio-economic development. Agency is strengthened through diverse levers of change, including laws, policies, community initiatives, and individual resources, which expand women's ability to make and exercise choices. In turn, agency shapes demographic outcomes, such as fertility preferences, family formation, health, and migration, while also advancing development outcomes, including education, livelihoods, social protection, and political participation. These processes are mediated by socio-cultural norms, institutions, and structural conditions, demonstrating that progress is context-specific, uneven, and non-linear. Given India's vast socio-cultural and economic diversity, examining empowerment at the sub-national level is critical to understanding regional variations

in gender norms, employment patterns, and reproductive autonomy.

As a leading Indian NGO working on population dynamics, gender equity, and sexual and reproductive health, Population Foundation of India addresses population issues through rights-based and empowerment approaches, empowering women, men, and youth to make informed decisions about their fertility, health, and wellbeing. To build a robust, evidence-based rationale for scaling up investments in women and girls, Population Foundation of India commissioned this study to:

- Examine the interlinkages between women's empowerment, female workforce participation, population dynamics, and human development at the national and sub-national levels.
- Explore the connections between women's empowerment, female workforce participation, and population dynamics at the micro level.
- Analyse how social and cultural norms shape the relationship between women's empowerment, female workforce participation, and fertility at the individual level; and
- Provide evidence-based recommendations for gender-responsive policy and programmatic interventions.

The study's findings provide valuable insights into the barriers and opportunities for women's empowerment, offering actionable recommendations for policymakers, researchers, and stakeholders focused on gender equality and economic inclusion. These insights may contribute to ongoing policy and programme discussions in the country.



METHODOLOGY AND APPROACH

METHODS

To achieve the objectives outlined in the previous section, the research uses both primary and secondary data to examine the interlinkages between women's empowerment, women's workforce participation, and population dynamics.

Although population dynamics include various factors, such as fertility, mortality, migration, and urbanisation, this study focuses specifically on the 'fertility' component.

Both quantitative and qualitative findings were triangulated through a comprehensive literature review.

The study objectives defined the scope of the research, aligning the research questions accordingly.

Objectives	Research Questions
i. To examine the interlinkages between women's empowerment, women's workforce participation, population dynamics and human development, at the macro level (sub-national).	1. How do state-level variations in human development indicators correlate with levels of women's empowerment, workforce participation, and population dynamics in Indian states?
ii. To examine the interlinkages between women's empowerment, women's workforce participation, and population dynamics at the micro level.	2. How do women's empowerment, workforce participation, and fertility simultaneously impact each other, considering the bidirectional relationships among these aspects? a. Is higher women's empowerment associated with lower fertility and higher workforce participation? b. Is higher workforce participation associated with lower fertility and higher women's empowerment? c. Is lower fertility associated with higher women's empowerment and higher workforce participation?
iii. To analyse the role of social and cultural norms in influencing the interrelation between women's empowerment, workforce participation, and fertility at the individual level.	4. What roles do social and cultural aspects play in influencing the interrelation between women's empowerment, workforce participation, and population dynamics?

Research questions 1 and 2 were addressed using the methodology outlined in the subsequent section.

Development of two composite state-level indices as quantitative measures of women's empowerment and overall human development, and an examination of the association between these indices, fertility rates, and women's work participation rates at the sub-national level.

An econometric analysis using Structural Equation Modelling (SEM) using unit-level data from the NFHS-5 (2019-21), to examine the associations between women's empowerment, workforce participation and fertility at the individual level. SEM can highlight possible links and indirect pathways between these variables; however, with cross-sectional data, the findings only reflect associations, not proven cause-and-effect relationships. Nonetheless, this analysis is useful for assessing the plausibility of the theoretical framework and for guiding further research, particularly with longitudinal or experimental designs.

For this study, women's empowerment has been defined in accordance with the level of analysis. At the macro level, the development of a women's empowerment index draws on aggregate sub-national data across key domains of empowerment (economic, social, and political), consistent with established methodologies. At the micro level, the analysis focuses on women's agency within the household, measured through relevant indicators available in the dataset. More details are provided in the subsequent section.

A. DEVELOPMENT OF STATE-LEVEL INDICES

Two state-level indices were developed following the globally accepted methodologies as quantitative measures of human development and women's empowerment.

MEASURE OF HUMAN DEVELOPMENT

The Human Development Index (HDI), published by the United Nations Development Programme (UNDP) as part of the Human Development Report (HDR), is a globally recognised and widely accepted measure to assess a country's level of human development. It was created to emphasise that people's capabilities should be the ultimate criterion for assessing a country's development, rather than focusing solely on economic

growth. Initiated in 1990, the HDI is a summary measure of average achievement of a country in three key dimensions of human development: (a) Long and Healthy Life, (b) Access to Knowledge, and (c) Decent Standard of Living. The HDR published in 2025 covered 193 countries, with Iceland ranking first with a score of 0.972, and South Sudan ranking 193rd with a score of 0.388. India ranked 130th with a score of 0.685 [66].

In 2001-02, following the UNDP's human development framework, the erstwhile Planning Commission of India published India's first National Human Development Report (NHDR), which calculated the HDI for a select number of states. India's second NHDR was published in 2011. Following this, the Social Statistics Division of the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI), Government of India, computed the HDI for all states/ union territories for the years 2011-12 and 2017-18. Post 2017-18, state-level HDI has not been published in India.

MEASURE OF WOMEN'S EMPOWERMENT

In 1995, the UNDP introduced two global indices—the Gender Development Index (GDI) and the Gender Empowerment Measure (GEM). GEM was the first-ever attempt to measure the extent of gender inequalities across the globe. In 2010, the UNDP constructed the Gender Inequality Index (GII) by incorporating additional indicators of women's vulnerability. In 2012, Bhattacharya and Banerjee emphasised the latent nature of empowerment, reflected through capability enhancement [67]. Later, Bhattacharya, Banerjee, and Bose (2012) measured women's empowerment at the individual level [68]. Also, in 2012, the Oxford Poverty and Human Development Initiative (OPHI), in collaboration with the United States Agency for International Development (USAID) and the International Food Policy Research Institute (IFPRI), developed the Women's Empowerment in Agriculture Index (WEAI). The first global Women Empowerment Index (WEI) comparable across countries was published by UN Women and UNDP as part of the report titled **"The Path to Equal: Twin Indices on Women's Empowerment and Gender Equality, 2023"**. The report provides two indices: the Women's Empowerment Index (WEI) and the Global Gender Parity Index (GGPI). The WEI focuses solely on women, measuring their power and freedom to make choices and seize opportunities in life. The report grouped 114 countries out of a total of 195 for which data on different dimensions of women's empowerment are available. Sweden achieved the highest score of 0.826, while Yemen recorded the lowest score of 0.14. India, with a score of 0.52, was also categorised in the low women's empowerment group.

While there is no explicit WEI in India at the state level, certain dimensions of women's

empowerment are covered under the GII, published alongside the HDI in 2017-18, and as part of NITI Aayog's SDG India Index. Also, though, the global HDI and WEI are valuable indices, their construction faces two key constraints. First, only indicators available for a broad set of countries can be included to allow global comparisons. Second, this limits the ability to reflect country-specific nuances in human development and women's empowerment. To address this, the HDI and WEI have been adapted to the Indian context by refining and expanding the indicators, enhancing their relevance and accuracy.

ADAPTIVE HUMAN DEVELOPMENT INDEX (AHDI)

To address the absence of a recent state-level HDI, the Adaptive Human Development Index (AHDI) has been created. It incorporates all the indicators used in UNDP's HDI and adds two additional indicators to make the index more comprehensive in the Indian context. The indicators included in AHDI are presented in ***Table 1***. The additional indicators not part of the UNDP's HDI are highlighted in the table.

Table 1:

Indicators included in creating Adaptive Human Development Index (AHDI)

Dimensions	Indicators
Long and Healthy Life	Life expectancy at birth
	Malnourished children (underweight according to weight-for-age) under 5 years of age (%)
	Maternal Mortality Ratio (MMR)
Knowledge	Expected years of schooling for children (years)
	Mean years of schooling for adults aged 25 years and older
Decent Standard of Living	Log of per capita Net State Domestic Product (NSDP)

Two additional indicators are included under the dimension of **'Long and Healthy Life.'**

Childhood Malnourishment (% of malnourished children under 5 years of age, as determined by weight-for-age criteria): This indicator is included in AHDI due to its strong predictive value for lifelong health outcomes. The proportion of children under five years who are stunted is a critical indicator of the 'Long and Healthy Life' dimension of HDI due to both its origin and its long-term consequences. In India, persistently high rates of childhood malnourishment are closely linked to the fact that 32% of children during 2019-21 (NFHS-5) were born with low birth weight—a direct result of maternal undernutrition. This reflects the intergenerational transmission of poor health and nutrition from mother to child, undermining the very foundation of a healthy life from birth. Moreover, underweight is not merely a marker of early-life adversity; it has effects on physical health, increasing the risk of chronic illnesses such as diabetes and cardiovascular disease in adulthood. It also impairs brain development, leading to cognitive delays, reduced school performance, and lower productivity later in life. Therefore, childhood underweight is a crucial indicator for any index seeking to capture the capability to lead a long and healthy life.

Maternal Mortality Ratio: The inclusion of the MMR as part of the 'Long and Healthy Life' dimension of the global HDI is both essential and distinctive. While life expectancy at birth (LEB) provides a broad measure of population health, MMR draws specific attention to the gendered dimensions of health outcomes, particularly the persistent and preventable risks women face during pregnancy and childbirth. Far from being a case of double counting (given life expectancy at birth is also an indicator), MMR highlights the systemic neglect of women's health—an area often obscured in aggregate health statistics. It reflects access to quality maternal healthcare, the strength of primary health systems, and underlying social inequalities such as nutrition, early marriage, and gender discrimination. As a sensitive barometer of women's wellbeing and broader health system responsiveness, MMR enriches the index by making it more gender-aware and representative of structural barriers to healthy living.

Overall, the addition of childhood malnourishment and MMR to life expectancy at birth (LEB)—the sole indicator in the global index as part of the 'Long and Healthy Life' dimension—is particularly appropriate for the Indian context. These two indicators highlight critical areas of health neglect that limit the capability to lead long and healthy lives. Combined with LEB, they provide a more comprehensive and equity-sensitive measure of health outcomes, capturing dimensions that LEB alone cannot reveal.

ADAPTIVE WOMEN EMPOWERMENT INDEX (AWEI)

The AWEI has been developed to fill a critical gap in measuring women's empowerment at the sub-national level in India. By offering a more nuanced and localised understanding, AWEI enables policymakers to design targeted interventions and monitor progress more effectively. The Index has been developed based on the methodology and dimensions used in the global WEI, as part of the "The Path to Equal: Twin Indices on Women's Empowerment and Gender Equality, 2023" report published by UN Women and UNDP. A few additional indicators and modifications to the existing indicators used in the global index have been incorporated to enhance the sensitivity and relevance of the AWEI for India. ***Table 2*** provides a snapshot of the dimensions and additional indicators included in the construction of AWEI.

Table 2:

Indicators included in the creation of the AWEI

Dimensions	Indicators
Life and Good Health	Currently married women (15-49 years) using any modern family planning method (%)
	Adolescent fertility rate (births per 1,000 women aged 15–19 years)
	Women aged 15-24 years using a hygienic method during their menstrual period (%)
Education, Skill-Building & Knowledge	Women (25 years and older) with completed secondary education or higher (%)
	Female youth (15-24 years) not in education, employment or training (NEET) (%)

Dimensions	Indicators
Labour and Financial Inclusion	Women (15-59 years) engaged in paid work (excluding unpaid helpers in family enterprises) (%)
	Women of (15-49 years) who have a bank or savings account that they themselves use (%)
Participation in Decision-Making	Share of seats held in State Assemblies by women (%)
	Share of managerial positions held by women (%)
Freedom from Violence	% Ever-married women (18-49 years) who experienced (often or sometimes) physical or sexual violence committed by their husband in last 12 months

In comparison to the indicators included in the global WEI, one new indicator has been introduced within the dimension **'Life and Good Health'**, and a few refinements have been made to the original indicators under the dimensions of **'Labour and Financial Inclusion' and 'Participation in Decision-Making'**.

Currently married women (15-49 years) using any modern family planning method (%): This indicator provides a more objective and actionable measure of contraceptive coverage than the proportion of women who need contraception and are using modern methods. It captures actual usage rather than subjective perceptions, making it more reliable for monitoring access, identifying gaps, and informing reproductive health policies. Use of modern contraceptive methods is an essential aspect of women's lives that allows them to realise their capabilities fully. As a globally accepted metric, it also aligns with SDG targets, enabling consistent comparisons across regions and time.

Menstrual hygiene (% of women aged 15-24 years using a hygienic method during their menstrual period): Menstrual hygiene is introduced as a critical indicator under the "Life and Good Health" dimension to better capture women's access to health resources, autonomy, and dignity. Menstrual health management is essential

not only for physical wellbeing but also for upholding gender equity and social inclusion. According to NFHS-5, although 78% of Indian women aged 15-24 years use a hygienic method during menstruation, significant regional and rural-urban disparities persist. States such as Bihar and Madhya Pradesh report usage rates of around 60%. Again, almost half (49.6%) of the women in rural India still rely on cloth due to affordability and accessibility barriers. Poor menstrual hygiene is often correlated with low levels of education, poverty, and inadequate health infrastructure, reflecting broader systemic inequities. Including this indicator enables the index to assess women's control over their bodies, social status, and access to basic health and dignity more effectively, all of which are foundational to empowerment.

Females participating in paid work (% of females aged 15-59 years engaged in paid work, excluding unpaid helpers in family enterprises): We have refined the indicator on women's economic participation by focusing on paid work rather than relying on the broader definition of Labour Force Participation Rate (LFPR) among women living in households with a couple and at least one child under six years of age. This change is motivated by two key reasons: First, the sample size for women meeting this specific household structure in nationally representative surveys is relatively small, leading to less reliable and skewed estimates for smaller states and union territories. Second, a considerable share of women reported as economically active in India are unpaid helpers in family enterprises—roles that do not fully represent economic agency or empowerment. By focusing on women's engagement in paid work, we aim to capture the true essence of economic empowerment by focusing on remunerative work.

Women's representation in State Assemblies (% seats held by women in State Legislative Assemblies): This indicator reflects the need for a more nuanced understanding of women's political empowerment at the regional level. The indicator on women's representation in Parliament from each state often suffers from extreme variations due to the smaller number of seats allocated to each state and union territory, making the metric less stable. In contrast, State Assemblies, with their larger and more distributed seat counts, offer more granularity and reduced bias. Similarly, the indicator on women's representation in local governments has not been used since the existing data already reflects the mandatory 33% reservation for women. Due to this mandate, data suggests that several states in India have achieved, or are close to, 50% women's representation in local governments. Thus, this indicator lacks variation across states, rendering it unsuitable for creating an index.

The inclusion of menstrual hygiene, participation in paid work, and representation in state assemblies makes AWEI more context-sensitive and reflective of ground realities. These adjustments address existing regional disparities, prioritise actual economic agency over labour force participation, and highlight involvement in leadership roles, thereby strengthening the index's ability to represent empowerment and support relevant policy interventions to improve women's empowerment. The list of indicators under AHDI and AWEI, with detailed operational definitions, year, and sources, is presented in Annexure ***Table A1*** and ***Table A3***, respectively. Data points for some indicators were not available for all 28 states and 8 union territories of India, necessitating adjustments. Such data issues and adjustments are mentioned in Annexure ***Table A2*** and ***Table A4***.

METHODOLOGY FOR CREATION OF INDICES

After identifying the indicators for each dimension of the composite indices, the steps for calculating the AHDI and AWEI are described in ***Box 1***, following a similar methodology used for constructing the global indices: HDI and WEI.

Box 1: Methodology for Construction of Composite Indices of AHDI and AWEI

To create AHDI and AWEI, we followed steps similar to those outlined in the UNDP's "Human Development Report 2022-23" and the "The Path to Equal: Twin Indices on Women's Empowerment and Gender Equality, 2023", by UNDP and UN Women, respectively. Correlation checks were conducted for all indicators across various dimensions of both indices to ensure no significant overlap among indicators for the calculation of the composite indices.

A. Normalising the Indicators

The normalisation process converts indicators with varying units of measurement into a standardised range, typically from 0 to 1. The maximum values for an indicator (where higher values correspond to better outcomes), or goalposts, serve as 'aspirational targets' against which the indicators are normalised. The minimum value of the indicator is the lowest value it can possibly take. The minimum and maximum values for each indicator were established to arrive at the normalised values. Details on the selection of the specific minimum and maximum values of

each indicator are provided in Annexure A5. For instance, the maximum values for some of the indicators under AHDI have been derived from the ideal or target values set in the report "Gendering Human Development, MoSPI, 2017-18" or UNDP's "Human Development Report, 2022-23". Similarly, for some of the indicators under AWEI, references from the global index in the "Path to Equal Report, 2023" are used.

Indicators can be categorised into two types: Positive and Negative.

- For a positive indicator, a higher value signifies a better outcome or output.
- For a negative indicator, a higher value indicates worse performance.

The following formulae were used to calculate the normalised figures:

$$\textbf{Normalised Positive Indicator (I)} = \frac{\text{actual value-minimum value}}{\text{maximum value-minimum value}}$$

$$\textbf{Normalised Negative Indicator (I)} = \frac{\text{maximum value-actual value}}{\text{maximum value-minimum value}}$$

B. Calculating the Dimension Indices

The dimension indices are calculated as the unweighted arithmetic mean of the normalised indicators within each dimension. For example, the indices for the dimensions 'knowledge' and 'health' as part of the AHDI was calculated as follows:

$I_{Knowledge} = \frac{1}{2} (I_{EYS} + I_{MYS})$,

where I_{EYS}= Normalised value for expected years of schooling

I_{MYS}= Normalised value for mean years of schooling

$I_{Health} = (I_{LEB} + I_{underweight} + I_{MMR})$

where I_{LEB} = Normalised value for life expectancy at birth

$I_{underweight}$= Normalised value underweight children

I_{MMR}= Normalised value for MMR

C. Aggregating the Dimension Indices to Create Composite Index

The AHDI and AWEI are the geometric means of their respective dimensional indices:

$$AHDI = (I_{Health} * I_{Knowledge} * I_{Decent\ Living})^{1/3}$$

$$AWEI = (I_{Health} * I_{Edu\&Knowledge} * I_{Labour} * I_{Leadership} * I_{Violence})^{1/5}$$

Once AHDI and AWEI were developed for all Indian states and union territories, they were categorised into three groups based on the values of the composite indices: High, Medium and Low (***Table 3***). Additionally, the states and union territories have been arranged into three sets for comparison purposes: (a) major states[v], (b) northeastern states (excluding Assam), and (c) union territories. While presenting the findings, we have included Delhi among the major states, given its role as the national capital, and Assam, due to its larger population and geographic size compared to other northeastern states. We have categorised the rest in line with union territories and the northeastern states.

Table 3:

Grouping categories for states and union territories

Score for Composite Index	Index Group Category
0.6 and above	High
0.4 to 0.59	Medium
0.39 and below	Low

B. ECONOMETRIC ANALYSIS USING STRUCTURAL EQUATION MODELLING (SEM)

To examine the interlinkages between women's agency, workforce participation, and fertility at the individual level, the study used data from the NFHS-5 (2019-2021). Unit-level data is accessible on the official website of the Demographic and Health Survey (DHS) programme (***The DHS Program - India: Standard DHS, 2019-21 Dataset***). The NFHS is a nationally representative survey of

[v] *Major states include all Indian regions recognised as states including the National Capital Territory (NCT) of Delhi except the northeastern states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.*

Indian households that provides essential information on health, family welfare, and demographic indicators. Round 5 captures several aspects related to women's agency and intra-household decision-making abilities, which are important indicators of agency and empowerment.

Additionally, it collects data on the total number of childbirths, along with various child-related indicators and a limited set of indicators on workforce participation. The NFHS-5 collected information from 724,115 women aged 15-49 years across 707 districts in India. Given that it is the only large-scale, nationally representative, and up-to-date data source available from which information on all three domains can be extracted, the NFHS unit-level dataset was utilised for econometric analysis using the SEM approach. The SEM approach was employed to explore the linkages between women's empowerment, workforce participation, and fertility at the individual level, as these three aspects may simultaneously influence each other.

A SEM helps specify a model where variables can act as both predictors and outcomes, allowing for testing of theories on the associations among these variables. In cases of two-way causation such as this, the model cannot be treated as a single-equation model. Therefore, estimation of parameters cannot be conducted without considering the information provided by other equations in the system. Thus, a non-recursive SEM was used that allows for bidirectional effects and any reciprocal causation between endogenous variables. In the system of equations, women's empowerment, work participation, and population dynamics, which are determined by fertility outcomes, are endogenous variables.

The three endogenous variables[vi], used in the model are as follows:

- **Workforce Participation:** Whether an individual has been in the workforce in the past 12 months.
- **Fertility:** Total children ever born to a woman.
- **Women's Agency Index:** A range of variables used for developing an index.

Fertility is modelled as an endogenous variable because it is both shaped by and shapes women's empowerment and workforce participation, creating a reciprocal relationship of high policy relevance. There is ample Indian and global literature supporting the use of children ever born as a standard fertility indicator in analyses of empowerment and labour force participation. Evidence suggests that empowered women may have fewer children because they can act on their aspirations,

[vi] ***Endogenous variables:*** *Endogenous variables are determined by the system of equations. At least one path points to it.*

but having children can also influence empowerment through enhanced bargaining power, societal recognition, or access to resources, especially among low-income families. In its true sense, our analysis considers fertility, i.e., the total number of children ever born to a woman, as an indicator that helps unpack the complex pathways linking empowerment, labour force participation, and structural constraints that affect women's ability to exercise reproductive choice.

Exogenous (independent) variables[vii], that explain the endogenous variables include the age of woman, her husband's or partner's age, the highest educational attainment of both the woman and her husband/ partner, current usage of modern contraceptive method by the women, total household members, wealth quintile based on wealth index, social group, place of residence (Rural/Urban), religion, and state of residence.

The analysis was restricted to currently married women in the 15-49 year age group. From the total sample, data for all variables included in the model were available for 54,224 married women. The sample details for the analysis are listed in ***Table 4***.

Table 4:

Details of NFHS sample of women and sample used in the analysis

Category	NFHS-5 Sample
All women (15-49 years)	7,24,115
All married women (15-49 years)	5,12,408
Married women covered in empowerment section	77,729
Married women covered in the analysis	54,224

SEM is designed to handle non-recursive relationships through the inclusion of feedback loops and latent or unobserved variables. Given the nature and type of endogenous variables (binary, count, and continuous), Generalised Structural Equation Modelling (GSEM) was found to be a more suitable approach. Our non-recursive GSEM model is specified based on the

[vii] ***Exogenous variables:*** *Exogenous variables are the variables not influenced by any other variable in the model. They act as independent inputs that explain changes in other variables, called endogenous variables.*

established theoretical frameworks in demography and gender economics [69]. The postulated reciprocal relationships are:

- **Fertility Workforce Participation:** A higher number of children increases domestic workload, potentially reducing the probability of labour force participation (the 'cost of time' hypothesis).
- **Workforce Participation Fertility:** Participation in the labour market increases the opportunity cost of having children, potentially reducing fertility (the 'opportunity cost' hypothesis).
- **Agency (a key aspect of empowerment):** Modelled as both an outcome and a predictor. We hypothesise that workforce participation enhances empowerment (economic agency/decision-making power), while higher empowerment may influence fertility desires and labour force decisions.

GSEM allows for the flexibility to model different types of endogenous variables and can incorporate latent constructs. It can also handle non-linear and non-recursive relationships, unlike traditional SEM. Apart from the endogenous variables, a range of exogenous variables was included to control for socio-economic characteristics that may influence the endogenous variables. These exogenous variables are grouped into two categories: household characteristics and individual characteristics. A detailed list of these variables is provided in ***Table 5***.

Table 5:

List of variables used in GSEM

Endogenous Variables	Exogenous /Explanatory Variables
1. Women's empowerment*	1. State
2. Women currently working or not	2. Age of woman
3. Fertility (total children ever born)	3. Husband's or partner's age
	4. Total household members
	5. Household quintile based on Wealth Index
	6. Highest education attainment of woman
	7. Current usage of modern contraceptive method by women

Endogenous Variables	Exogenous /Explanatory Variables
	8. Husband or partner's education level 9. Social group/caste 10. Place of residence (rural/ urban) 11. Religion

During the construction of the model, women's agency was initially planned to be used as a latent variable, as it is not directly observed in the NFHS dataset; however, multiple observed indicators represent different aspects of empowerment. However, when agency was initially constructed as a latent variable, it could not be used in the final model, as GSEM does not allow non-recursive relationships among endogenous variables when one of them is a latent construct and the other two are observed variables (fertility and work participation), within a single system of equations. As the next best alternative, a women's agency index was constructed using the Principal Component Analysis[viii] (PCA) method, based on indicators reflecting women's empowerment in the NFHS dataset. PCA estimates principal components from the observed indicators, and the first principal component, which represents the largest amount of variance in the dataset, is used as the final index score. The indicators used to create the Women's Agency Index are presented in ***Table 6***. The indicators selected for the index capture a few crucial dimensions of women's agency: the ability to make decisions regarding their mobility, intra-household decision-making power, not suffering from any intimate partner violence (IPV), bodily autonomy in terms of contraception usage and choice of physical intimacy, and the ability to decide how to use their own money and use mobile phones for communication.

[viii] ***Principal Component Analysis (PCA):*** *PCA reduces the number of dimensions in large datasets to principal components that retain most of the original information. It achieves this by transforming potentially correlated variables into a smaller set of variables, known as principal components.*

Table 6:

Indicators used to construct the Women's Agency Index from NFHS-5

Sr. No	Indicator
1.	Women use modern contraceptive method
2.	Usually allowed to go alone to the market, health facility, or places outside this village
3.	Women 'alone' or jointly with husband/partner decide on their healthcare
4.	Women 'alone' or jointly with husband/partner decide on large household purchases
5.	Women 'alone' or jointly with husband/partner decide on visits to family or relatives
6.	Women experienced no less severe physical violence by husband/ partner
7.	Women experienced no severe physical violence by husband/ partner
8.	Women experienced no sexual violence by husband/partner
9.	Women experienced no emotional violence by husband/partner
10.	Women have their own money that they can decide to use alone
11.	Women can say no to husband/partner if one does not want to have sexual intercourse
12.	Women are able to read text (SMS) messages
13.	Women alone or jointly decide on usage of contraception

The Women's Agency Index is constructed based on multiple observed variables in the NFHS-5 dataset that capture key dimensions of women's agency and ability to make decisions, with a focus on outcome variables. The outcomes for empowerment included indicators that reflect women's ability to make choices and agency. Based on the selection of variables, multiple iterations

were run, and model fit was compared across three types of models to assess the best type. Initially, a few input variables were also considered. However, the model, which consisted of multiple input variables along with outcome variables, was found to be insignificant, and some of the variables were eventually dropped. These variables could be adding noise rather than improving the model's accuracy. Therefore, the construction of the index was contingent not only on the availability of data but also on variables that facilitate the development of a best-fit model. We have also mentioned in the limitations of the study that agency is understood and conceptualised differently across the literature; the results of the analysis are expected to vary accordingly.

Stata 15 was used to conduct the econometric analysis. The SEM builder in Stata was used to create a path diagram illustrating the relationship between variables, as presented in Diagram 1 of Annexure A.

VALIDATION PROCEDURES

The model was identified through two complementary approaches.

1. First, instrumental variables (IVs) were applied, drawing on theoretically grounded factors that influence one endogenous variable without directly affecting the other. For example, 'use of contraception' was employed as an instrument for fertility within the workforce participation equation, on the basis that it affects the likelihood of having fewer children but does not directly shape workforce participation once other covariates are controlled for. Similarly, 'husband or partner's education', if measured before the outcome variables, was considered a suitable instrument for workforce participation within the fertility equation.
2. Second, model constraints were introduced by allowing the error terms of the endogenous variables, such as fertility and workforce participation, to covary with each other. This is a standard and necessary procedure for estimating non-recursive relationships, accounting for the possibility of unobserved common causes.

CRITERIA FOR VARIABLE INCLUSION AND EXCLUSION

Variables were included based on three criteria:

1. They represent key theoretical constructs identified in the literature, such as women's age, level of education, partner's income, place of residence, and access to health and childcare services.
2. They serve as statistical controls for known confounders. For instance, a woman's age and partner's age are well-established predictors of both fertility and labour force participation.

3. They act as valid instruments for model identification, as described above. For each instrument, the rationale for the exclusion restriction was explicitly stated.

Variables were excluded when they met one or more of the following conditions:

1. They were highly collinear with other predictors, resulting in unstable estimates.
2. They represented post-treatment variables, such as current income, which would be inappropriate in a model where income is itself determined by workforce participation.
3. They demonstrated no meaningful theoretical or empirical association during preliminary analyses, and their inclusion did not improve model fit, as assessed by the Akaike Information Criterion/ Bayesian Information Criterion (AIC/BIC).

STRATEGIES TO STRENGTHEN CAUSAL INFERENCE

Several strategies were employed to ensure robustness in estimating causal effects using cross-sectional data.

1. Non-recursive modelling with instrumental variables was the primary strategy for addressing reciprocal causation. While not free from limitations, the use of instruments provides a stronger foundation for causal inference than recursive models alone.
2. A comprehensive set of observed confounders was controlled for, including socio-economic, demographic, and contextual covariates such as education, ethnicity, region, household wealth quintile, and partner's education, thereby reducing the risk of omitted variable bias.
3. Sensitivity analyses were conducted to assess robustness. These included testing alternative model specifications, estimating different recursive structures, and comparing effect sizes and directions. In addition, sub-sample analyses were undertaken (e.g., urban versus rural populations) to check the consistency of findings across different groups.
4. Finally, limitations were explicitly acknowledged. While the approach improves upon basic Ordinary Least Squares (OLS) regression methods, residual confounding from unmeasured factors such as cultural norms, individual motivation, or genetic predispositions cannot be fully excluded. For this reason, the findings are interpreted as revealing strong associative patterns that are consistent with causal hypotheses, rather than conclusive evidence of causality.

MODEL FIT

AIC and BIC were used to assess model fit. AIC and BIC were used across three models with various combinations of control variables to compare model fitness (Refer to ***Table 8***). The differences between Model 1, Model 2, and the final model are due to the choice of exogenous variables, as well as differences in the construction of the women's agency index (with and without input indicators). The list of agency variables included in the finalised model has already been discussed previously. In terms of the women's agency index, Model 1 does not include any variables reflecting sources (or inputs) of agency. Model 2 consisted of multiple input variables, including ownership of land and a house, frequency of reading newspapers, listening to the radio, watching television, going to the cinema, and ability to use the internet, as well as the variables included in the final model. The fitness of the model was checked, and the results are included in ***Table 8.*** Among the three models, the final model was selected as it had the lowest AIC and BIC values[ix].

Table 7:

List of control variables in comparable models

Exogenous Variables	Model 1	Model 2	Final Model
State	✓	✓	✓
Age of woman	✓	✓	✓
Husband's or partner's age			✓
Total household members			✓
Household quintile based on Wealth Index	✓	✓	✓
Highest educational attainment of woman	✓		✓
Current usage of modern contraceptive method by women	✓		✓

[ix] ***AIC and BIC:*** *Akaike's information criterion (AIC) and the Bayesian information criterion (BIC) are commonly used for selecting an optimal model from the alternatives. While comparing different models, the model with the lowest value of AIC and BIC is preferred because the greater the number of unnecessary parameters, the higher the value of AIC/BIC due to the penalty. The model with the lowest value of information criterion is considered to be a better fit for the given data.*

Exogenous Variables	Model 1	Model 2	Final Model
Husband's/Partner's educational level			✓
Social group/caste	✓	✓	✓
Place of residence (rural/urban)	✓	✓	✓
Religion			✓
Number of children aged 5 and under in the household	✓		

Current usage of modern contraceptive methods by women is included both as a component of the Women's Agency Index and as a covariate in the fertility equation (see path diagram annexure). The model also incorporates key theoretical covariates, such as age, education, and wealth, as exogenous observed variables to account for major sources of confounding and to strengthen the causal identification of relationships among the primary endogenous variables.

Table 8:

Goodness of fit of fitted models

	Observations	Log Likelihood	AIC	BIC
Model 1	57, 534	-225762.1	452072.3	454527.4
Model 2	54, 224	-212034.9	424623.8	427089.4
Final Model	54, 224	-211820.2	424014.4	425678.9

C. QUALITATIVE RESEARCH DESIGN TO UNDERSTAND THE ROLE OF SOCIAL NORMS

Research question 3 was approached using a qualitative research design and purposive sampling. Qualitative design enabled a deeper understanding of how social norms influence the pathways between women's empowerment, employment, and demographic outcomes, as drawn from the lived experiences of respondents. While adapted indices and econometric modelling capture correlations and measurable dimensions, qualitative inquiry helped us to unpack the mechanisms through which norms influence behaviours, explain unexpected or non-linear patterns in the data, and capture local variation. The IDIs were conducted using a vignette approach. IDIs were conducted in Uttar Pradesh, Bihar, and Delhi, covering a total of six districts. To account for geographical differences and the rural-urban context, the interviews were conducted in rural, peri-urban, and urban areas ***(Table 9)***.

Table 9:

Study sites and sample distribution for the In-Depth Interviews (IDIs)

Type of Location	State	District	Number of IDIs
Urban	Uttar Pradesh	Lucknow	6
	Delhi	South Delhi	6
Peri-Urban	Bihar	Nawada	6
	Uttar Pradesh	Barabanki	6
Rural	Bihar	Darbhanga	6
	Uttar Pradesh	Bahraich	6
Total	**3**	**6**	**36**

TARGETED RESPONDENTS

The IDIs were conducted with two groups of respondents. Within each group, the respondents were further divided into three categories.

1. **Adolescent girls (18-19 years):** (a) Dropouts; (b) Currently studying; (c) Married.
2. **Young women (20-29 years):** (a) Unmarried and working; (b) Married and working; (c) Married and not working.

In every selected location, six IDIs were conducted, representing each of the six categories of respondents mentioned above. The respondents were selected using a purposive sampling approach.

APPROACH FOR CONDUCTING IDIS

The qualitative interviews with adolescent girls focussed on their perception of empowerment and the impact of social norms. The interviews elicited responses regarding their understanding of reproductive health choices and the skill requirements for workforce participation, which aligned with their preferences, future aspirations, and outlook.

Conversely, the interviews with young women adopted a retrospective approach to explore their past experiences and the societal contexts that shaped their lives, focusing on their empowerment and the impact of social norms.

Given the distinct objectives of the interviews with adolescent girls and young women, different hypothetical yet relatable stories were constructed as vignettes to explore how cultural norms operate and shape the attitudes and beliefs of participants in specific situations. Two unique vignettes were administered for each category, and a common vignette was administered to both groups (adolescent girls and young women). Among the unique vignettes, the second vignette served as an extension of the first story, maintaining the central character's integrity throughout the extended narrative. Thus, three vignettes were administered to each respondent during the IDIs (***Table 10***).

Table 10:

Vignettes for each category of respondent in a district

Respondent Group	Category	Unique Vignette	Common Vignette	Total Vignette
Adolescent girls (18-19 years)	School Dropout	2	1	3
	Currently studying	2		3
	Married	2		3
Young women (20-29 years)	Unmarried and working	2	1	3
	Married and working	2		3
	Married and not working	2		3

QUALITATIVE ANALYSIS: APPROACH

Interviews were conducted in Hindi and audio-taped after obtaining informed consent from the participants. The audio-taped interviews were transcribed and translated into English for analysis. Considering the vignette inquiry, a coding frame was developed using both inductive and deductive approaches. MAXQDA qualitative software was used to organise the emerging themes.

Qualitative findings complement quantitative results and provide evidence-based, actionable recommendations to advocate for increased investment in women and girls, aiming to unlock the true potential of the 'demographic and gender dividend'.

ETHICAL CONSIDERATIONS

For the econometric analysis, unit-level data from NFHS-5 were used, sourced from the official website (as mentioned earlier). Respondents in the NFHS survey undergo informed consent before participation, following approval of the protocol by the Institutional Review Board (IRB) of the International Institute for Population Sciences (IIPS). The protocol for the NFHS-5 survey, including the content of all survey questionnaires, was approved by both the IIPS and the ICF International Inc. (ICF) IRB. The protocol was also reviewed by the U.S. Centers for Disease Control and Prevention (CDC). Therefore, no separate ethical approval was required for the use of unit-level NFHS data.

Since the IDIs with adolescent girls and young women involved human interaction, ethical approval to conduct the interviews was obtained from the Institute for Financial Management and Research (IFMR) IRB. An informed consent form was administered to each respondent before the interview, and all participants were thoroughly briefed about the study. Only those who willingly and voluntarily agreed to participate were included in the interviews. The vignettes used for the IDIs were designed to be culturally sensitive and respectful. During the interviews, every effort was made to create a safe and supportive environment in which participants could share their experiences. Debriefing sessions were held after the interviews to help participants process their emotions and clarify any questions about data confidentiality. The interviews primarily took place in home settings, where extra precautions were taken to ensure privacy.

Quantitative findings, whether derived from indices or econometric analysis, were presented in aggregate. For qualitative findings from IDIs, considerable care was taken to ensure the study was conducted sensitively, acknowledging the diverse marital, educational, and employment backgrounds of the participants. Adequate care was taken to avoid biases or generalisations that could misrepresent their lived experiences.

LIMITATIONS AND CHALLENGES

1. While finalising the indicators for the development of AHDI and AWEI at the state and union territory levels in India, data points for some indicators were unavailable for all 28 states and 8 union territories. To address these challenges, certain adjustments were made, such as using the average value of neighbouring states or the national average. More details on these data issues and the adjustments made are provided in the annexures.

2. The NFHS data has its own inherent limitations. The primary objective of the NFHS survey is to provide detailed information on health, fertility, and family welfare rather than workforce participation. Consequently, the dataset contains limited information in this regard. Other national representative datasets, such as the PLFS, provide comprehensive information on workforce participation but lack detailed data on fertility and women's empowerment indicators.

3. Women's empowerment, as a complex phenomenon, is challenging to measure and is often subject to interpretation. In the econometric analysis, women's agency is measured using an index that reflects intra-household agency and decision-making power, focusing on key outcome variables. The approach adopted in the study was deemed most suitable given the availability of data through the NFHS dataset. However, other research studies on this subject may identify different ways of conceptualising women's empowerment. Upadhyay and others (2014) identified at least 19 domains of women's empowerment [9]. Some studies use socio-demographic variables, such as women's education, employment, residence, and household economic status, as proxy variables for women's empowerment. These differences in conceptualisation can lead to different conclusions.

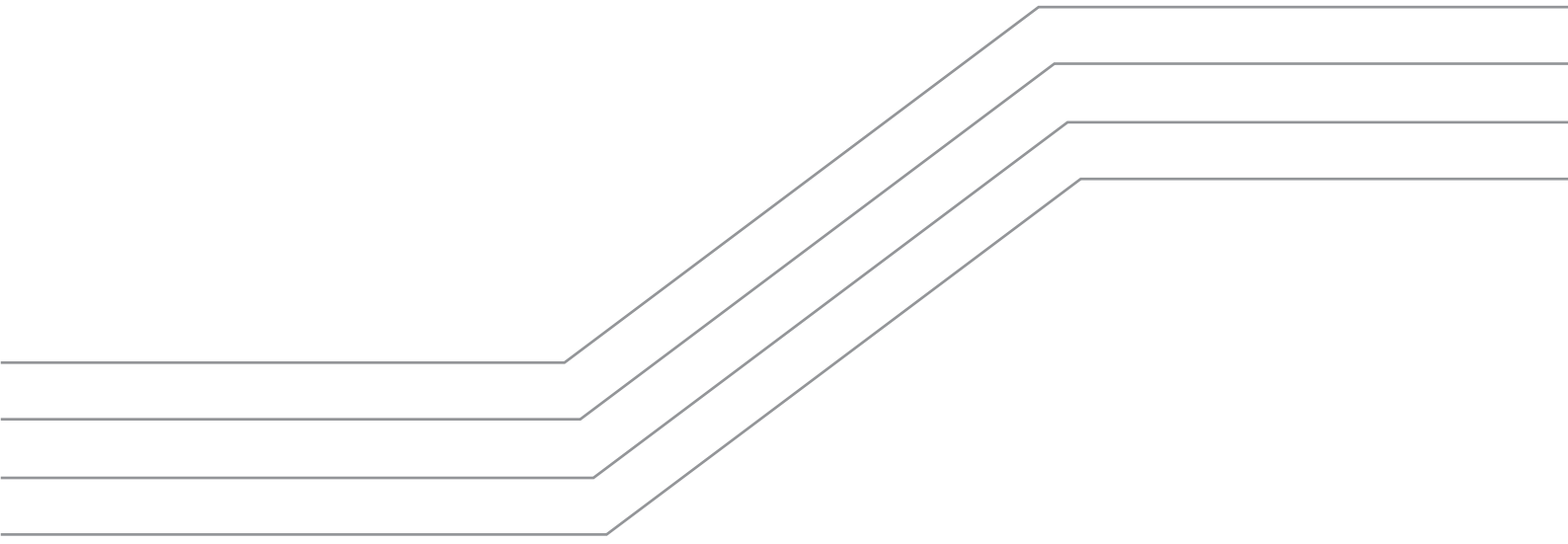
4. The econometric analysis in the study is restricted to currently married women aged 15-49 years; the indicators of women's agency and reproductive autonomy in the NFHS dataset are limited to this group (mostly). Consequently, the responses of women outside this age bracket are not captured. There is considerable

scope for future research to explore such interlinkages among unmarried women and young girls.

5. The TFR is defined by considering women's entire reproductive age group, rather than at a single point in time. Since NFHS is a cross-sectional dataset, it is not possible to establish cause-and-effect relationships between TFR and empowerment, as they only represent a one-time measurement of both the alleged cause and effect. Therefore, for the purpose of understanding relationships at the individual level through econometric modelling, fertility is indicated through the total number of children a woman has given birth to.

6. IDIs were conducted with a limited number of participants selected through purposive sampling. Therefore, the findings on the role of social norms on women's empowerment cannot be generalised. Also, identifying married adolescent girls for IDIs in urban localities such as Lucknow and South Delhi was quite challenging. All participants in this category (married adolescent girls) could only be identified from economically disadvantaged backgrounds.

7. Administering vignettes with adolescent girls was especially challenging in terms of ensuring free-flowing conversations related to knowledge regarding reproductive health and contraception. Since these discussions took place in home settings with limited space and with adults present, privacy could not be ensured in all cases. Consequently, the adolescents sometimes felt uncomfortable discussing topics such as contraception and premarital sex, and some of them chose to refuse to answer these questions.



INTERLINKAGES AMONG WOMEN'S EMPOWERMENT, HUMAN DEVELOPMENT AND FERTILITY RATE: MACRO LEVEL ANALYSIS

At the sub-national level, two composite indices (AHDI and AWEI) were developed, based on the methodology outlined in the previous section, to establish linkages between human development, women's empowerment, and a key indicator of population dynamics—the total fertility rate (TFR).

The AHDI and AWEI provide an overview of the status of human development and women's empowerment in each state and union territory in India.

Based on the composite scores for each index, states and union territories have been stratified into three broad categories—High, Medium, and Low—offering an insightful appraisal of their status with respect to women's empowerment and human development. The findings have been presented in three parts—major states, northeastern states, and union territories—since the differences in governance structures and population sizes do not make them comparable.

STATUS OF INDIAN STATES AND UNION TERRITORIES BASED ON AHDI

MAJOR STATES

The AHDI varies considerably across major Indian states. Among the 22 major states in India, Delhi (0.70), Goa (0.69), and Kerala (0.66) lead the rankings, reflecting relatively better achievements as compared to the others in this group. Tamil Nadu (0.63) and Himachal Pradesh (0.61) also perform satisfactorily. The six states in the 'High' AHDI category still have to cover a 30% to 40% gap to achieve the overall goal as set by the indicators within AHDI. Telangana, Uttarakhand, Haryana, Karnataka, Punjab, Gujarat, and Andhra Pradesh score between 0.54 and 0.59 and fall into the 'Medium' AHDI category, indicating moderate progress towards the goals. While West Bengal, Odisha, Rajasthan, Chhattisgarh, and Jharkhand fall in the 'Medium' category, their scores lie between 0.40 and 0.47, indicating that they still have to cover half the distance to achieve human development as defined by the index. Four of the major states—Assam, Madhya Pradesh, Uttar Pradesh, and Bihar—fall in the 'Low' AHDI category with a composite score below 0.40. Bihar, with the lowest score (0.21), stands out particularly because of severe deficits across all three dimensions of AHDI. Overall, the AHDI highlights significant interstate variations in human development. To better understand the factors contributing to the variations in AHDI across states, their performances in the three dimensions and the indicators are further explored.

"The AHDI reveals sharp inequalities in human development across Indian states: while Delhi, Goa, and Kerala inch closer to aspirational goals, states like Bihar, Uttar Pradesh, and Madhya Pradesh still struggle to cover even one-third of the distance."

Table 11:

Categorisation of major states based on AHDI

Rank-AHDI	Major States	Long and Healthy Life	Knowledge	Decent Standard of Living	Adaptive HDI	AHDI category
1	**Delhi**	0.66	0.70	0.74	0.70	HIGH
2	**Goa**	0.57	0.73	0.78	0.69	
3	**Kerala**	0.74	0.70	0.57	0.66	
4	**Tamil Nadu**	0.65	0.64	0.60	0.63	
5	**Himachal Pradesh**	0.60	0.67	0.57	0.61	
6	**Maharashtra**	0.59	0.63	0.57	0.60	
7	**Telangana**	0.56	0.62	0.60	0.59	MEDIUM
8	**Uttarakhand**	0.54	0.65	0.56	0.58	
9	**Haryana**	0.52	0.61	0.61	0.58	
10	**Karnataka**	0.51	0.61	0.61	0.58	
11	**Punjab**	0.59	0.61	0.50	0.57	
12	**Gujarat**	0.50	0.52	0.62	0.55	
13	**Andhra Pradesh**	0.57	0.54	0.51	0.54	
14	**West Bengal**	0.51	0.58	0.34	0.47	
15	**Odisha**	0.47	0.52	0.40	0.46	
16	**Rajasthan**	0.47	0.52	0.38	0.45	
17	**Chhattisgarh**	0.35	0.50	0.40	0.41	
18	**Jharkhand**	0.49	0.47	0.28	0.40	
19	**Assam**	0.30	0.54	0.32	0.37	LOW
20	**Madhya Pradesh**	0.32	0.47	0.29	0.35	
21	**Uttar Pradesh**	0.31	0.49	0.20	0.32	
22	**Bihar**	0.39	0.40	0.06	0.21	

LONG AND HEALTHY LIFE

Kerala is closest to achieving the aspirational targets under the 'Long and Healthy Life' dimension of AHDI among the large states, followed by Delhi, Tamil Nadu, Himachal Pradesh, and Maharashtra. In terms of specific indicators, Delhi and Kerala observed the highest life expectancy at birth (LEB) at 76 and 75 years, respectively. Similarly, underweight among children aged less than 5 years was lower in Punjab at 16% and Kerala at 20%. Kerala is closest to the globally accepted aspirational goalpost of 10 maternal deaths per 100,000 births, with the state's current MMR at 19; followed by Maharashtra (33), Telangana (43), Andhra Pradesh (45), and Tamil Nadu (54). On the other hand, Assam, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, and Bihar are the bottom five states in this dimension, covering only about one-third of the distance to the ideal score. Chhattisgarh and Uttar Pradesh have the least LEB in the country, with 65 and 66 years, respectively. Again, the highest proportion of underweight children as reported by NFHS-5 was found in Bihar at 41%, closely followed by Gujarat at 40%. Assam (195), Madhya Pradesh (173), Uttar Pradesh (167), and Chhattisgarh (137) also registered much higher MMR. Lower scores in this dimension highlight the need for greater investment in nutrition, healthcare infrastructure and maternal health services in these states. These distinctions reflect the overall effectiveness of the health system and the living conditions of the regions.

KNOWLEDGE

Among the major states, Goa, Delhi, and Kerala, with scores above 0.70 in the 'Knowledge' dimension, indicate their progress towards relatively better educational outcomes. In contrast, Bihar, Madhya Pradesh, and Jharkhand scored below 0.50, suggesting they remain significantly distant from the aspirational targets for both indicators—expected years of schooling for children and mean years of education completed by adults aged 25 years or above. These gaps reflect deep-rooted structural challenges and emphasise the urgency for sustained interventions to reach the targets. The average number of completed years of education among the population (25 years & above) is highest in Kerala and Goa (10 years each), reflecting relatively better access to education. In contrast, Bihar (5 years), Jharkhand (6 years), Andhra Pradesh (7 years), and Madhya Pradesh (7 years) highlight significant gaps. For expected years of schooling, Goa (15 years) and Delhi (14 years) lead among major states, approaching the aspirational target of 18 years. In contrast, Bihar records the lowest EYS at 8 years.

DECENT STANDARD OF LIVING

The dimension of 'Decent Standard of Living' uses a single indicator—the logarithm of per capita Net State Domestic Product (NSDP)—to reflect the economic wellbeing of the population. Higher per capita NSDP ideally indicates better access to resources, incomes, and services. Among the 22 major

states, Goa (5.5), Delhi (5.4), and Gujarat (5.3) record the highest values, reflecting relatively better standards of living, on average. In contrast, Bihar (4.5) and Jharkhand (4.8) are at the lower end, indicating substantial differences in economic levels compared to the better-performing states. These figures highlight the uneven progress across regions in achieving a decent standard of living.

NORTHEASTERN STATES

Among the seven northeastern states (excluding Assam), Sikkim (0.62) and Mizoram (0.61) record the highest Adaptive HDI scores, placing them in the 'High' AHDI category, with relatively better performances in the 'Decent Standard of Living' and 'Knowledge' dimensions. The remaining five states fall into the 'Medium' AHDI category, reflecting moderate achievements, while they still have almost half to go to achieve the human development targets within AHDI. While 'Knowledge' outcomes are relatively better across several states, gaps in living standards, especially in Manipur and Meghalaya, continue to lower their overall scores. Notably, the northeastern state of Meghalaya reports one of the highest EYS at 16 years, indicating satisfactory access to school education.

Table 12:

Categorisation of northeastern states (excluding Assam) based on AHDI

Rank-AHDI	Northeastern States (Excluding Assam)	Long and Healthy Life	Knowledge	Decent Standard of Living	Adaptive HDI	AHDI category
1	**Sikkim**	0.58	0.54	0.75	0.62	HIGH
2	**Mizoram**	0.58	0.73	0.54	0.61	
3	**Arunachal Pradesh**	0.56	0.56	0.45	0.52	MEDIUM
4	**Tripura**	0.51	0.58	0.41	0.49	
5	**Meghalaya**	0.50	0.68	0.32	0.48	
6	**Manipur**	0.58	0.68	0.28	0.48	
7	**Nagaland**	0.50	0.57	0.35	0.47	

UNION TERRITORIES

Among the seven union territories, Chandigarh (0.68) and Puducherry (0.64) ranked top in AHDI scores, and they both fall in the 'High' AHDI category, driven by better performances in the dimensions of 'Knowledge' and 'Standard of Living'. For instance, Chandigarh (0.81) and Puducherry (0.71) show relatively higher scores in the 'Knowledge' dimension, with Chandigarh (11 years) reporting higher MYS. Chandigarh also ranked highest among union territories (0.72) in economic wellbeing. Andaman & Nicobar Islands (0.58) and Lakshadweep (0.52) fall in the 'Medium' category with moderate outcomes. While Jammu & Kashmir (0.50), Dadra & Nagar Haveli and Daman & Diu (0.49), and Ladakh (0.49) also remain in the 'Medium' category, their per capita NSDP was relatively lower, bringing down the composite index scores.

Table 13:

Categorisation of union territories based on AHDI

Rank-AHDI	Union Territories	Long and Healthy Life	Knowledge	Decent Standard of Living	Adaptive HDI	AHDI category
1	**Chandigarh**	0.53	0.81	0.72	0.68	HIGH
2	**Puducherry**	0.70	0.71	0.54	0.64	
3	**Andaman & Nicobar Islands**	0.53	0.61	0.61	0.58	MEDIUM
4	**Lakshadweep**	0.51	0.61	0.44	0.52	
5	**Jammu & Kashmir**	0.64	0.56	0.34	0.50	
6	**Dadra & Nagar Haveli and Daman & Diu**	0.44	0.62	0.44	0.49	
7	**Ladakh**	0.64	0.55	0.34	0.49	

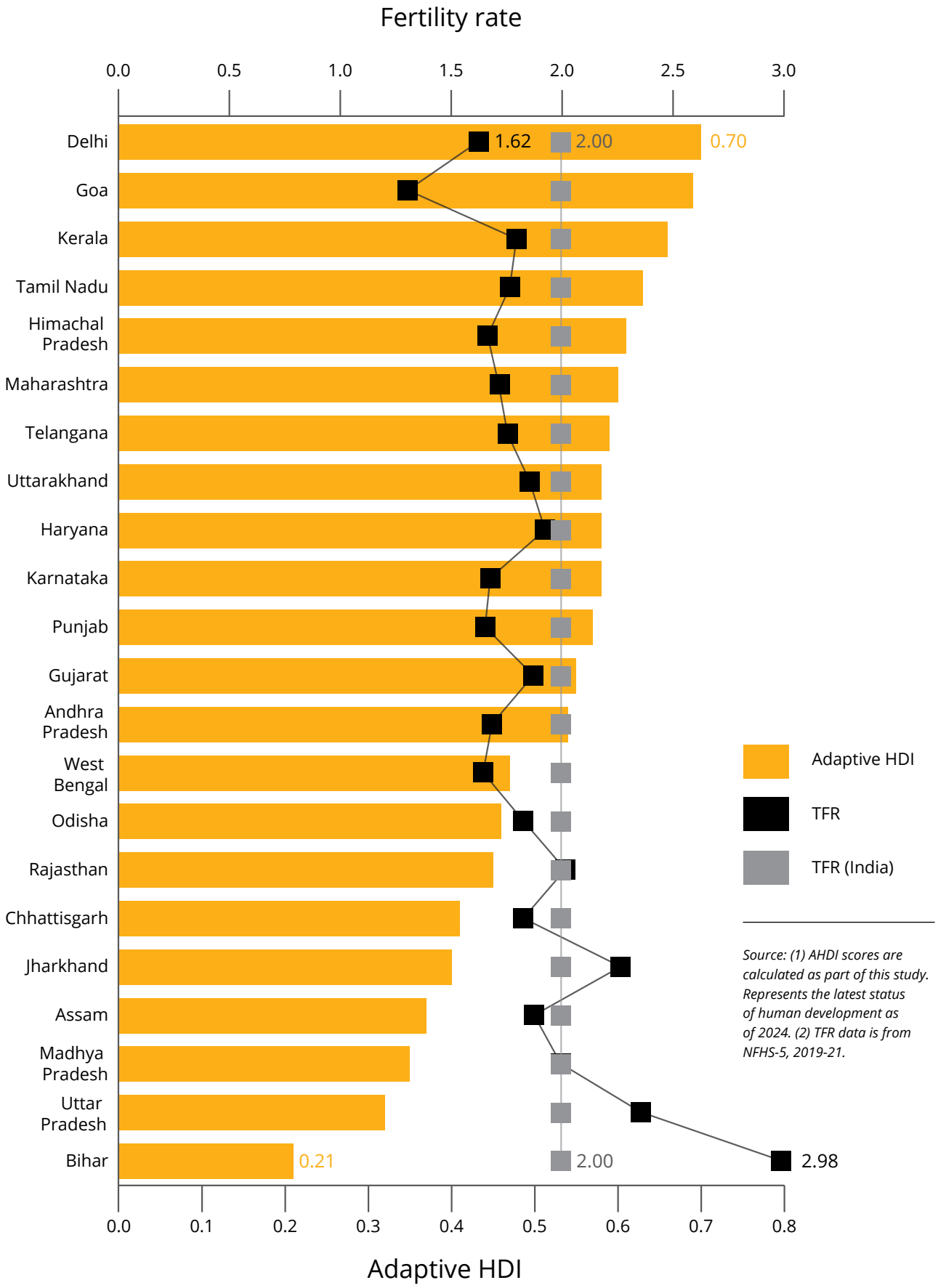
ASSOCIATION BETWEEN HUMAN DEVELOPMENT AND FERTILITY RATE

Across all states and union territories, a negative correlation (r: -0.64) is observed between AHDI and TFR, indicating that higher levels of human development are generally associated with lower fertility rates. Although this correlation is moderately strong, it also reflects the influence of broader socio-cultural and economic factors on fertility decisions. TFR shows a weaker correlation with the 'Long and Healthy Life' dimension (r: -0.5) and 'Knowledge' dimension (r:-0.34) but a stronger correlation with the 'Decent Standard of Living' dimension (r: -0.7), pointing to the significant role of economic conditions in influencing fertility decisions. The findings suggest that economic conditions exert a more pronounced influence on fertility than health or education outcomes. While improvements in health and education are important, they appear less decisive in shaping fertility behaviour compared to household income, employment security, and material living standards.

Figure 1 illustrates the relationship between AHDI and TFR among major states. Among the low AHDI states, Bihar and Uttar Pradesh recorded TFRs exceeding the national average of 2.0. Most other states in the 'High' and 'Medium' AHDI categories predominantly reported TFR below the replacement level (2.1). This demonstrates significant progress toward reduced fertility rates, even in contexts of relatively lower human development. Such advancements can largely be attributed to targeted policy interventions and programmatic efforts in the areas of health and family planning[x] and changing aspirations of women to have smaller families, which is reflected in the total wanted fertility rate (1.6) as per NFHS-5.

[x] ***Family Planning under the National Health Mission:*** *India holds the distinction of being the first country in the world to launch a National Programme for Family Planning in 1952. This pioneering initiative has since been reinforced through key policy frameworks, including the National Population Policy (NPP) 2000, the National Health Policy (NHP) 2017, and the National Rural Health Mission (NRHM). These policies articulate clear family welfare objectives, reflecting India's commitment to international mandates, including the International Conference on Population and Development (ICPD), the Millennium Development Goals (MDGs), and the Sustainable Development Goals (SDGs). At the policy level, the strategies emphasise a rights-based and community-centric approach, eschewing targets in favour of voluntary adoption of family planning methods. The principles of "children by choice, not by chance" guide interventions tailored to communities' felt needs. Service delivery strategies focus on promoting spacing methods, ensuring quality of care, and expanding contraceptive options to empower individuals and couples in making informed reproductive choices. Mission Parivar Vikas, launched in 2017, initially targeted 146 high-priority districts across seven high-focus states—Bihar, Uttar Pradesh, Assam, Chhattisgarh, Madhya Pradesh, Rajasthan, and Jharkhand. This initiative has since been scaled up to cover all districts in these states and six northeastern states, with the aim of ensuring the availability of contraceptive products at all levels of the health system.*

Figure 1: AHDI scores and Total Fertility Rates across Major States



A few states present a complex and insightful relationship with TFR. For example, with a comparatively low AHDI score of 0.47, West Bengal recorded a significantly low TFR of 1.64, well below the replacement level. This may be a result of the fertility transition in the last two decades in the state. It could be 'distress-driven' or regulated by an aspiration towards a child or by ideas/values related to low fertility, or it can be a culmination of various factors that initiate a reduction in demand for children, after which supply-side factors come into play and fertility reduces [70]. A primary study conducted in rural West Bengal argued that the presence of high aspirations for children in an economically insecure setting initiates a distinctive sense of parental responsibility, generating a unique local socio-ecology of low fertility not previously observed in the context of rural fertility decline. Responsibility-laden aspirations towards children and reasoned-rational deliberations about fertility outcomes serve as subliminal motives for having a small family, challenging common assumptions regarding the relationship between economic hardship, rurality, and fertility [71]. Thus, West Bengal's low TFR may be attributed to economic constraints, socio-cultural norms favouring smaller families, male out-migration, accessible reproductive healthcare, female education, and policy interventions, despite persistent gender inequities and developmental challenges.

The relationship between human development and fertility rates is inherently dynamic and context-specific. Globally, research highlights an intricate and evolving discourse on the interplay between TFR and the HDI. A seminal study by Myrskylä et al. (2009) underscores that while the inverse correlation between fertility and socio-economic development is one of the most well-documented patterns in social science research, recent cross-sectional and longitudinal analyses reveal a nuanced shift. At advanced stages of human development, further progress may reverse the declining fertility trend. This shift results in a J-shaped relationship, in which higher HDI levels are positively correlated with fertility rates in highly developed countries [72].

Various other studies have found that the association between HDI and TFR was similar to that between GDP per capita and TFR [72, 73]. This association between TFR and HDI is negative at HDI levels below 0.85–0.9. As the HDI is close to 0.9, the HDI-TFR association reverses to a positive relationship [72].

Harttgen and Vollmer (2014) challenged the robustness of the observed reversal in the HDI-TFR relationship, arguing that this linkage weakens when the HDI is disaggregated into its core components—education, health, and standard of living. Their findings raise questions about the reliability of a positive relationship between HDI and TFR at advanced stages of human development

[74]. Subsequent studies, such as Cheng et al. (2022), have identified inverted U-shaped relationships between GDP per capita and TFR, as well as between life expectancy and TFR [75]. However, a linear relationship was observed between female education and HDI. In developed regions, slight increases in TFR were noted at high levels of GDP, schooling, and HDI. Conversely, Gaddy (2021) observed a weakening of this trend in highly developed countries after 2010, with a pronounced decline in TFR and no clear correlation between HDI and TFR at very high levels of development (HDI > 0.8) [76]. At the local level within the U.S., Ryabov (2015) supported the classic demographic transition theory, identifying a negative association between human development and fertility [77]. These findings indicate that the relationship between TFR and HDI is context-specific, shaped by both demand- and supply-side factors, with no single pattern evident across economies at different stages of development.

In the Indian context, an earlier study revealed that the relationship between fertility and development is strongly negative, convex, and consistent over time. However, the strength of this association exhibits significant regional variation, reflecting the diverse socio-economic, cultural, and policy environments across the country [78]. While India achieved replacement-level fertility at the national level by 2021, following the onset of the fertility transition in the 1970s, this overall progress conceals significant regional disparities. Developed states such as Kerala and Tamil Nadu achieved replacement-level fertility decades earlier, driven by higher socio-economic development and the implementation of effective public health initiatives. In contrast, states with lower levels of socio-economic development, such as Uttar Pradesh and Bihar, continue to report high fertility rates, at 2.35 and 2.98 births per woman, respectively, during 2019-21. Within states, there are districts with high fertility due to various factors. An earlier study using NFHS-5 estimated that only 326 out of 707 districts had a fertility rate below the replacement level of 2.1. Sixty-seven districts were estimated to have a high fertility rate of at least 3 births per woman of reproductive age [79]. The Government of India also identified 146 districts with a TFR above 3.0 across seven states under Mission Parivar Vikas.

This uneven transition underscores the relationship between fertility dynamics and broader issues of social, gender, and economic inequalities as well as regional development within the country.

STATUS OF INDIAN STATES AND UNION TERRITORIES BASED ON AWEI

The AWEI offers a multidimensional view of women's empowerment status across Indian states and union territories by considering multiple dimensions such as assessing health, education, access to paid work, financial inclusion, decision-making, and freedom from domestic violence.

MAJOR STATES

Of the 22 major states, 17 states fall in the 'Medium' AWEI category, and 5 states fall in the 'Low' AWEI category. This indicates that most of the states continue to face persistent gaps in key areas of women's empowerment. None of the major states has been able to make it to the 'High' AWEI category as they are far behind in the aspirational goalposts for the majority of the indicators considered to develop the index. Excluding the top two states, the rest have not yet reached halfway (index value less than 0.5) in terms of the goalposts for the various dimensions of AWEI. Within the major states, while states like Goa (0.57) and Kerala (0.54) demonstrate relatively higher levels of women's empowerment, they still fall well short of ideal benchmarks, particularly in the dimensions 'Labour and Financial Inclusion' and 'Participation in Decision-Making'. Goa performs well in 'Life and Good Health' (0.62) and 'Freedom from Violence' (0.91) but shows a notable gap in women's participation in decision-making (0.29). Similarly, Kerala scores high in dimensions related to women's education (0.70) and health (0.56), yet faces challenges in labour and financial inclusion (0.43) and decision-making (0.30). In contrast, states such as Bihar (0.28), Uttar Pradesh (0.36), and Assam (0.35) show significant deficits across multiple dimensions of women's empowerment. Bihar, for instance, scores particularly low in education (0.22), labour and financial inclusion (0.31), and decision-making (0.18), indicating deep-rooted structural barriers to women's empowerment that persist across these states. To better understand the factors contributing to variations in AWEI across states, the following section explores their performance in the five dimensions and the indicators within each dimension.

"No major Indian state has reached 'High' levels of women's empowerment, persistent gaps in decision-making, economic inclusion, and education reveal how far the country still stands from its gender equity goals."

Table 14:

Categorisation of major states based on AWEI

Rank-AHDI	Major States	Education, Skill-Building & Knowledge	Life and Good Health	Labour and Financial Inclusion	
1	**Goa**	0.62	0.77	0.46	
2	**Kerala**	0.56	0.70	0.43	
3	**Tamil Nadu**	0.46	0.72	0.58	
4	**Himachal Pradesh**	0.57	0.72	0.51	
5	**Delhi**	0.51	0.74	0.28	
6	**Chhattisgarh**	0.43	0.55	0.38	
7	**Punjab**	0.44	0.68	0.42	
8	**Andhra Pradesh**	0.36	0.54	0.45	
9	**Telangana**	0.46	0.64	0.48	
10	**Haryana**	0.47	0.70	0.30	
11	**Uttarakhand**	0.49	0.70	0.39	
12	**Odisha**	0.34	0.52	0.47	
13	**Maharashtra**	0.47	0.58	0.34	
14	**Gujarat**	0.39	0.47	0.33	
15	**Karnataka**	0.45	0.62	0.49	
16	**Rajasthan**	0.37	0.63	0.38	
17	**West Bengal**	0.36	0.43	0.40	
18	**Madhya Pradesh**	0.34	0.46	0.33	
19	**Jharkhand**	0.40	0.39	0.37	
20	**Uttar Pradesh**	0.35	0.51	0.30	
21	**Assam**	0.37	0.33	0.43	
22	**Bihar**	0.32	0.22	0.31	

	Participation in Decision-Making	Freedom from Violence	Adaptive AWEI	AWEI Categories
	0.29	0.91	0.57	MEDIUM
	0.30	0.89	0.54	
	0.27	0.52	0.49	
	0.14	0.89	0.48	
	0.31	0.74	0.47	
	0.34	0.71	0.46	
	0.19	0.85	0.46	
	0.38	0.58	0.46	
	0.26	0.52	0.45	
	0.22	0.78	0.44	
	0.15	0.83	0.44	
	0.28	0.64	0.43	
	0.24	0.66	0.43	
	0.27	0.81	0.42	
	0.31	0.31	0.42	
	0.20	0.73	0.42	
	0.28	0.66	0.41	
	0.31	0.61	0.39	LOW
	0.27	0.52	0.38	
	0.21	0.52	0.36	
	0.19	0.57	0.35	
	0.18	0.42	0.28	

LIFE AND GOOD HEALTH

The 'Life and Good Health' dimension of AWEI reflects the extent to which women in different states have access to essential health services, particularly related to reproductive health and menstrual hygiene. Among major states, Goa (0.77), Delhi (0.74), and Tamil Nadu (0.72) have made the most progress towards the goals envisioned under this dimension, such as the adolescent fertility rate being zero or access to modern contraceptive methods for all women of reproductive age, or all young women being able to maintain menstrual hygiene. Adolescent fertility rates were lower in Goa (14) and Delhi (19), and near-universal access to hygienic menstrual practices in Tamil Nadu at 98%, and in Goa and Delhi at 97% each. These states also benefit from relatively better healthcare infrastructure and higher levels of awareness, which contribute to better outcomes. Meanwhile, although Andhra Pradesh (0.46), Karnataka (0.42), and Telangana (0.45) do not score as high in this dimension, they demonstrate high usage (above 65%) of modern family planning methods, indicating specific strengths in contraceptive access that may not fully offset weaker performance in other indicators. At the other end, states like Bihar (0.22), Assam (0.33), and Jharkhand (0.39) score lowest in this dimension. High adolescent fertility rates, poor access to modern contraception, and limited access to menstrual hygiene tend to adversely impact women's empowerment in these states.

EDUCATION, SKILL-BUILDING & KNOWLEDGE

This dimension assesses women's educational attainment and their access to opportunities for continued learning and workforce participation. Goa, Himachal Pradesh, and Kerala lead in this area, supported by a higher share of women aged 25 and above who have completed secondary education or higher—Kerala (50%), Goa (45%), and Delhi (43%). These outcomes reflect better foundational education systems and a greater emphasis on female education. In contrast, Bihar (0.32), Madhya Pradesh (0.34), and Odisha (0.34) were the bottom three among the major states, with only 18% of women in Bihar and Madhya Pradesh having completed secondary education, pointing to continued challenges in access and retention. The gap between education and economic engagement is further reflected in the high NEET (Not in Education, Employment, or Training) rates in Uttar Pradesh (40%), Punjab (40%), and Bihar (38%), which limit young women's transition into the workforce. Goa's relatively low NEET rate (13%) reinforces its stronger alignment between education and work opportunities for women.

LABOUR AND FINANCIAL INCLUSION

This dimension captures women's access to paid work and control over financial resources. Among major states, Tamil Nadu (0.58), Himachal Pradesh (0.51), and Karnataka (0.49) emerge as the top performers in this dimensional index. Tamil Nadu (92%) and Karnataka (89%) report high bank account ownership and usage among women, while Himachal Pradesh records the highest share of women in paid work (43%).
Yet, these figures still point to limited economic participation of women overall. In contrast, states like Delhi (0.28), Haryana (0.30), and Uttar Pradesh (0.30) perform poorly, reflecting both lower labour force participation and weaker financial inclusion. Notably, Delhi (73%) and Gujarat (70%) fall below the national average in women's bank account usage, highlighting persistent disparities in financial access despite broader national coverage.

PARTICIPATION IN DECISION-MAKING

The dimension of 'Participation in Decision-Making' captures women's representation in decision-making roles across political and managerial spaces. In this dimension, most states score on the lower side, with top-performing states such as Andhra Pradesh (0.38), Chhattisgarh (0.34), and Karnataka (0.31) still reflecting moderate levels of progress.
In terms of share of women in State Assemblies, Chhattisgarh (21%), West Bengal (14%), and Jharkhand (12%) have the highest proportions; yet these figures still fall short of the 33% reservation benchmark—pointing to the ongoing need for institutional reforms. Much lower scores are observed in states like Himachal Pradesh (0.14), Uttarakhand (0.15), and Bihar (0.18).

Understanding the Higher Share of Women as Leaders in Chhattisgarh

Chhattisgarh has emerged as a leader in women's political representation, consistently electing the highest proportion of women Member of the Legislative Assembly (MLAs) among Indian states. In the 2023 assembly elections, 19 women were elected to the 90-member assembly (21.1%), surpassing the previous record of 16 women MLAs (17.8%) in 2018. This upward trajectory reflects systemic shifts in party strategies and voter behaviour. Electoral performance in the state has been strong, with all women MLAs in 2018 winning over 30% of the vote share. Factors such as women outnumbering men voters in 50 constituencies during the 2023 polls and parties allocating about 15% of phase-one tickets to women have further supported this trend.

FREEDOM FROM VIOLENCE

The dimension 'Freedom from Violence' as part of AWEI, is defined based on a single indicator 'Percentage of ever-married women (18-49 years) who have experienced (often or sometimes) physical or sexual violence committed by their husband in the last 12 months'. It helps capture intimate partner violence (IPV) across states that can vary based on socio-cultural norms, enforcement of legal provisions, and availability of formal support systems. The scores for this dimensional index indicate significant disparities across Indian states, with Karnataka scoring the lowest at 0.31, followed by Bihar at 0.42. On the contrary, Goa (0.91), Himachal Pradesh (0.89), and Kerala (0.89) perform considerably better. The proportion of women facing IPV is highest in the country in Karnataka at 41% as per NFHS-5 estimates, followed by Bihar at 35%. On the other hand, Goa, Himachal Pradesh, and Kerala report the lowest IPV rates among the large states.

Understanding Karnataka's High Spousal Violence Rates

Karnataka's notably high spousal violence rates compared to other states, are influenced by a mix of improved reporting mechanisms and unique regional dynamics. The state's sharp rise in reported cases—from 20.6% (NFHS-4) to 44.4% (NFHS-5)—partly reflects increased awareness and willingness to report abuse, particularly in urban areas, where women are more vocal about violence. However, underlying factors such as rapid urbanisation, economic disparities between urban and rural areas, and persistent patriarchal norms exacerbate domestic tensions. Rural regions, where traditional gender roles remain entrenched, continue to normalise abuse, while urban stressors like financial insecurity and migration further strain relationships.

NORTHEASTERN STATES

Among the seven northeastern states (excluding Assam), Mizoram and Sikkim performed relatively better in terms of AWEI, with composite scores of 0.57 and 0.56, respectively. Mizoram stands out with a high score in the 'Freedom from Violence' dimension at 0.88, reflecting low levels of violence against women. Both Mizoram and Sikkim show relatively higher participation in decision-making (Mizoram at 0.48 and Sikkim at 0.42) as compared to the rest, and have notable shares of women in managerial positions, with Mizoram at 41% and Sikkim at 33%. Additionally, the percentage of young women in NEET is low, indicating strong engagement in these areas.

Despite these strengths, challenges remain in the northeastern states. For example, the uptake of modern family planning methods is much lower in Manipur (18%) and Mizoram (31%). Again, Nagaland reported that only 64% of women aged 15-49 years owned and used bank accounts, which is below the national average. While states like Meghalaya, Nagaland, and Arunachal Pradesh have relatively higher participation of women in paid work, overall levels remain modest. Tripura, with the lowest AWEI score in the northeast at 0.39, struggles particularly in the dimensions of 'Life and Good Health' (0.25) and 'Participation in Decision-Making' (0.31), even though its score in the 'Freedom from Violence' dimension is relatively better at 0.82.

Table 15:

Categorisation of northeastern states based on AWEI

Rank -AWEI	Northeastern states (Excluding Assam)	Education, Skill-Building & Knowledge	Life and Good Health	Labour and Financial Inclusion	
1	**Mizoram**	0.57	0.58	0.43	
2	**Sikkim**	0.52	0.64	0.44	
3	**Arunachal Pradesh**	0.47	0.59	0.47	
4	**Manipur**	0.58	0.40	0.40	
5	**Meghalaya**	0.49	0.27	0.47	
6	**Nagaland**	0.51	0.58	0.35	
7	**Tripura**	0.33	0.25	0.41	

UNION TERRITORIES

The top two union territories in terms of AWEI score are Chandigarh (0.56) and Puducherry (0.54). Chandigarh stands out among the union territories with strong performance in 'Life and Good Health' (0.75) and 'Education, Skill-Building & Knowledge' (0.70), reflecting better access to healthcare and education for women. However, women's participation in decision-making remains low, with a score of just 0.26, indicating substantial room for improvement. The Andaman & Nicobar Islands (0.47) and Lakshadweep (0.42) have been successful in ensuring women's safety, scoring high on freedom from violence, but face challenges in women's workforce participation and basic financial inclusion.

The bottom two union territories in terms of AWEI—Jammu & Kashmir and Ladakh—fall in the 'Low' AWEI category, with composite scores of 0.39 each. Compared to health and education, these two union territories struggle more with very low women's participation in decision-making,

	Participation in Decision-Making	Freedom from Violence	Adaptive AWEI	AWEI Categories
	0.48	0.88	0.57	MEDIUM
	0.42	0.86	0.56	
	0.28	0.68	0.48	
	0.37	0.64	0.47	
	0.36	0.79	0.45	
	0.12	0.93	0.41	
	0.31	0.82	0.39	LOW

with scores as low as 0.07 in both. Some of the positive aspects of women's empowerment among the union territories include low adolescent fertility rates in Ladakh (2) and Chandigarh (9), and nearly universal access to hygienic menstrual products in Puducherry and the Andaman & Nicobar Islands (99%).

Table 16:

Categorisation of northeastern states based on AWEI

Rank -AWEI	Union Territories	Education, Skill-Building & Knowledge	Life and Good Health	Labour and Financial Inclusion	
1	**Chandigarh**	0.70	0.75	0.48	
2	**Puducherry**	0.53	0.75	0.56	
3	**Andaman & Nicobar Islands**	0.47	0.74	0.48	
4	**Lakshadweep**	0.40	0.70	0.18	
5	**Dadra & Nagar Haveli and Daman & Diu**	0.48	0.65	0.46	
6	**Jammu & Kashmir**	0.50	0.60	0.49	
7	**Ladakh**	0.49	0.64	0.56	

ASSOCIATION BETWEEN WOMEN'S EMPOWERMENT AND FERTILITY RATE

Similar to the AHDI, the AWEI exhibited a negative correlation (-0.5) with TFR. This suggests that improvements in women's empowerment are only moderately associated with a decline in fertility rates, highlighting the modest influence of enhanced education, work participation, and participation in decision-making roles on reproductive behaviour. Especially, the 'Life and Good Health' dimension of the AWEI demonstrated a stronger negative correlation with TFR (-0.7), emphasising the direct

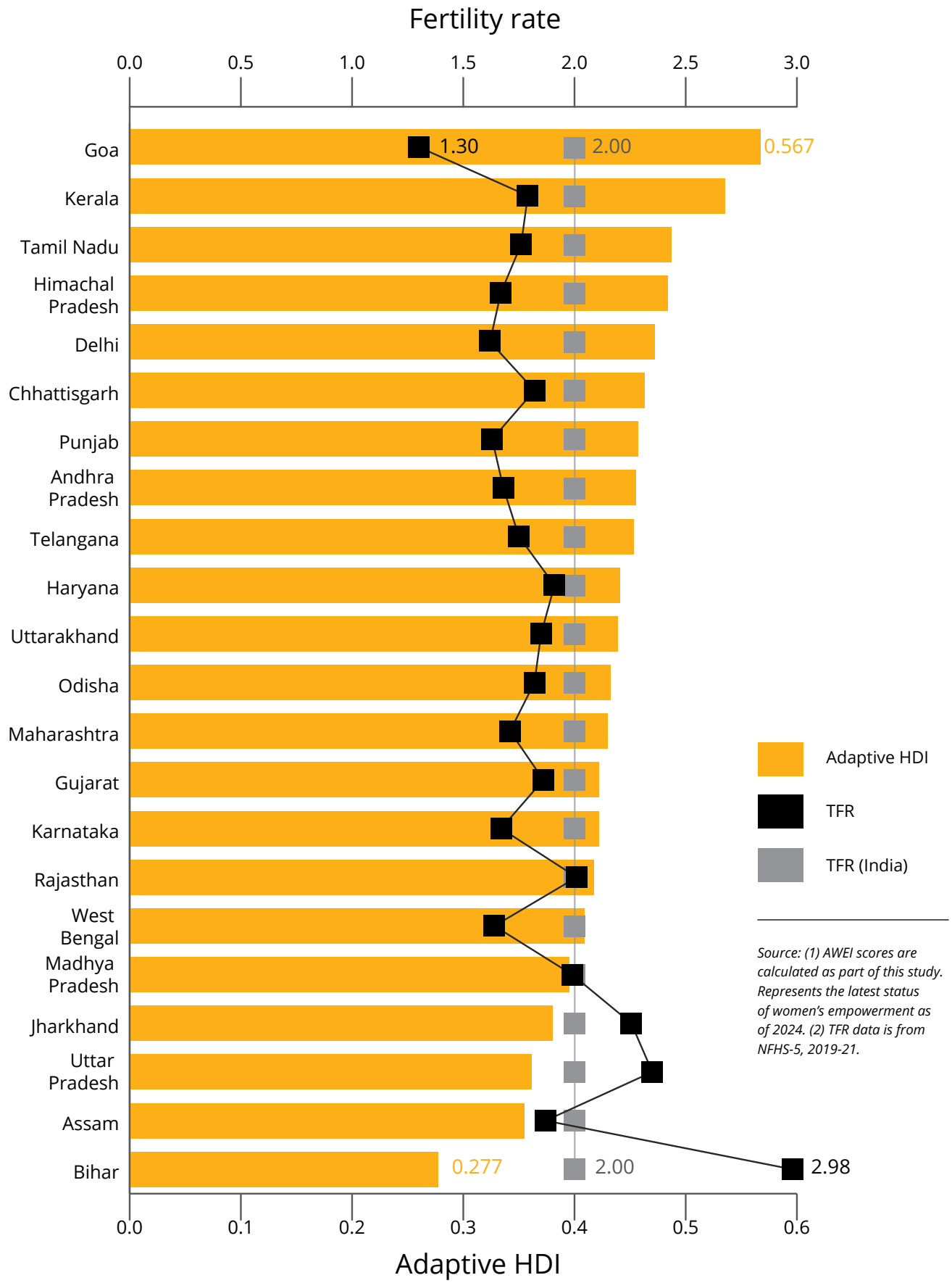
	Participation in Decision-Making	Freedom from Violence	Adaptive AWEI	AWEI Categories
	0.26	0.84	0.56	MEDIUM
	0.29	0.68	0.54	
	0.16	0.87	0.47	
	0.27	0.99	0.42	
	0.11	0.79	0.42	
	0.07	0.86	0.39	LOW
	0.07	0.71	0.39	

link between improved health outcomes for women and lower fertility rates. This highlights the critical role of health interventions in shaping fertility patterns. The findings show that fertility rates are more strongly associated with life and good health (r: -0.69) than with education (r: -0.38), labour participation (r: -0.29), or participation in decision-making (r: 0.08). Moderate links also appear with freedom from violence (r: -0.44). This suggests that while education and economic conditions matter, the most consistent associations lie with health outcomes and freedom from violence. Therefore, policy responses should prioritise investments in health systems and rights-based approaches, while continuing to strengthen education and labour opportunities. Economic policies alone may not shift fertility patterns, but integrated approaches that combine health, education, and decent work are likely to be more effective. However, further research is needed to understand causal pathways and inform targeted interventions.

"Improved health outcomes for women, not just broader empowerment, are most closely linked to lower fertility, underscoring the decisive role of reproductive health access in shaping demographic change."

Figure 2 illustrates the relationship between AWDI and TFR among the 22 major states. Goa, which tops the AWEI ranking, has the lowest TFR. However, the second state in terms of AWEI, Kerala, registered relatively higher TFR than many states. Earlier studies have highlighted that despite Kerala's widely recognised developmental achievements, the state lags in several key indicators of women's empowerment [80-82]. Conversely, of the four states at the bottom of the AWEI ranking—Jharkhand, Uttar Pradesh, Assam, and Bihar—three (excluding Assam) had TFRs greater than 2.25. Literature emphasises the critical role of accessible, high-quality reproductive health services in advancing women's empowerment, enabling them to exercise agency over their fertility, and enhancing their economic opportunities [83]. In the realm of social development, both media and academic research have extensively highlighted the achievements in women's empowerment within these states. For instance, in Sikkim, a range of policy interventions have contributed to enhancing the social and economic status of women. Notable among these are the Sikkim Panchayat (Amendment) Bill, 2011, the Chief Minister Rural Housing Mission (CMRHM), and the Sikkim Succession Bill, 2008, all of which introduced critical changes to promote gender equity. In addition, various programmatic initiatives in the state, such as the establishment of the Nayuma Women's Cooperative Society (NWCS) in 2001, have further strengthened women's empowerment, fostering greater socio-economic inclusion and participation [84].

Figure 2: AWEI scores and total fertility rates across major states



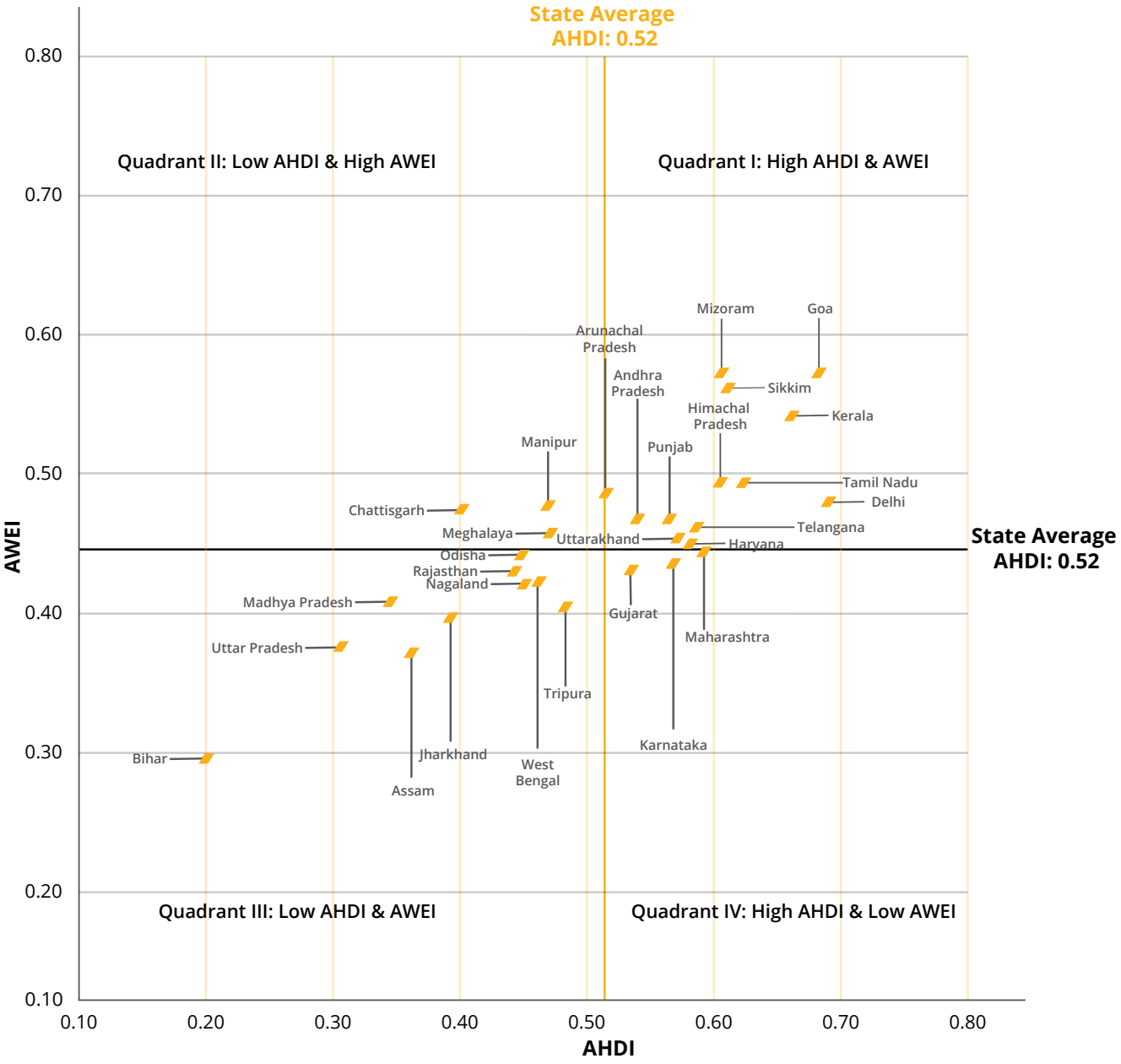
ASSOCIATION BETWEEN HUMAN DEVELOPMENT AND WOMEN'S EMPOWERMENT

A strong positive correlation (0.8) is observed between AHDI and AWEI. This highlights the interlinkages between human development and women's empowerment, underscoring their mutual reinforcement. The findings suggest that advancing women's empowerment—through improved access to education, economic opportunities, reproductive health services, and financial inclusion—plays a pivotal role in driving overall improvements in human development outcomes. Improvement in women's empowerment can positively impact all three dimensions of human development: 'Long and Healthy Life', 'Knowledge', and 'Decent Standard of Living'. For instance, women's empowerment through better access to education and quality healthcare not only enhances their own lives but also creates a multiplier effect. Better-educated women tend to raise healthier, better-educated children and make informed decisions about their own bodies, leading to improved maternal and child health outcomes, reduced child mortality, and eventually improved human development [85]. In addition, expanding economic opportunities for women —such as access to formal remunerative employment, entrepreneurship, and financial services —has a profound impact on household and national economies. A study estimates that closing gender gaps in labour-force participation, work hours, and employment sectors could increase global GDP by up to 26% by 2025 [86]. When women are active participants in the labour market, they not only contribute to economic growth but also help to reduce household poverty. A 2018 study by the McKinsey Global Institute highlighted that India has one of the most significant global opportunities to enhance GDP by advancing gender equality, with the potential to add $770 billion to its GDP by 2025 [87]. Studies have shown that women tend to reinvest a significant portion of their earnings back into their families, prioritising their children's health, nutrition, and education, which further strengthens human development outcomes. Therefore, while it is reported that gender equality increases when conditions for humans to thrive are facilitated, it is also believed that gender equality through women's empowerment is essential to enhance, accelerate, and achieve human development [88].

To gain a more nuanced understanding of the association, all states in India (including Delhi) have been grouped into four quadrants, using the state averages for the AHDI (0.52) and AWEI (0.44) as reference points.

Figure 3 illustrates the positioning of Indian states based on their AHDI and AWEI scores along the two axes.

Figure 3: Indian states across AHDI and AWEI



While several states may appear to demonstrate better performance by falling in Quadrant I, it is important to note that the absolute scores of state averages of AWEI and AHDI remain significantly below the ideal benchmark of 1. This is particularly evident in the case of the AWEI, where all states report scores below 0.6, highlighting substantial gaps in achieving desirable levels of women's empowerment. Also, given that the state figures are themselves relatively low, the concentration of states in Quadrant I should not be interpreted as indicative of strong performance across the majority of Indian states. Instead, it underscores the need for continued efforts to improve outcomes on both indices nationwide.

"Women's empowerment and human development reinforce each other, as expanding women's access to education, health, and economic opportunities advances gender equality and drives wider development outcomes, while progress in human development indicators such as life expectancy, healthcare, education, and income creates the conditions for women to live healthier lives, learn, work, and participate in decision-making."

Ten states—Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh, Assam, Odisha, Jharkhand, Tripura, West Bengal, and Nagaland—fall within Quadrant III, characterised by low scores on both the AHDI and the AWEI. Among these, four states exhibit relatively higher TFR—Bihar (2.98), Uttar Pradesh (2.35), Jharkhand (2.26) and Rajasthan (2.01). This highlights the need for specific measures to improve the performance of indicators pertaining to both human development and women's empowerment, including education, health, representation in leadership positions, and safety measures for women. The high TFR in Bihar, Uttar Pradesh, and Rajasthan is primarily driven by a combination of socio-cultural factors and economic underdevelopment. Cultural preferences for larger families, particularly the desire for male children, persist in these states, while traditional social norms favour early marriage and childbearing. Limited access to family planning services, compounded by misconceptions

about contraception, further aggravates the issue. Moreover, low levels of female education and empowerment restrict women's autonomy in reproductive decisions, and early marriage contributes to early pregnancies. Social and religious norms that emphasise reproduction, alongside inadequate healthcare infrastructure, especially in rural areas, perpetuate high fertility rates in these states. Economically, these states remain underdeveloped. Among all Indian states and union territories, Bihar reported the lowest per capita Net State Domestic Product (NSDP) at □32,174 (constant prices base year 2011-12, 2023-24), while Uttar Pradesh recorded a per capita NSDP of □50,875 during the same period. In 2017, the ease of doing business scores for Bihar (81.91) and Uttar Pradesh (92.89) were relatively low compared to other states and union territories, ranking them 18th and 12th, respectively [89].

Conversely, within Quadrant I, which represents high AHDI and AWEI scores, the majority of states demonstrate low TFRs, falling below the national average. The states with the lowest TFR include Sikkim, Goa, Delhi, Punjab, and Himachal Pradesh. Among these, Sikkim and Goa exhibit relatively higher AWEI scores, with Goa leading the group at 0.57. In Quadrant II, Meghalaya (2.91) and Manipur (2.17) report relatively higher TFRs. These states, despite relatively higher AWEI but lower AHDI scores, exhibit elevated TFR due to deep-rooted socio-religious and cultural factors. In Meghalaya, local leaders in districts like Khasi promote larger families to strengthen community identity, expand land cultivation, and enhance regional significance. The matrilineal inheritance system encourages men to prove their worth by having larger families, linking children to claims to shared property [90]. Christian institutions dominate societal norms [91, 92], discouraging open discussion on sexuality, contraception, or abortion, with contraception uptake remaining taboo even for health workers. NHFS-5 data show modern contraceptive usage is low (22.5%) in Meghalaya, with the lowest adoption in the Khasi and Jaintia regions. The case of Meghalaya underscores the pivotal role of socio-cultural norms in shaping fertility patterns and highlights the necessity of addressing them comprehensively. It illustrates that the dividends of economic development or women's empowerment may not translate into desired demographic or social outcomes unless embedded socio-cultural practices are addressed diligently. Previous studies focusing on the northeastern states have revealed that despite widespread awareness of contraceptive methods, the adoption of modern contraceptives remains limited, especially among tribal women [93]. This low utilisation is primarily attributed to deep-rooted socio-cultural barriers, particularly prevalent within tribal communities [92-94].

This emphasises the need for an integrated approach combining economic initiatives with targeted social and behavioural change communication interventions to address social and cultural barriers and improve the accessibility of modern contraceptives.

"States with both low human development and low women's empowerment continue to report high fertility, reinforcing how underinvestment in education, health, and gender equality fuels persistent demographic and economic challenges."

Relatively newly formed states—Chhattisgarh (2000), Uttarakhand (2000), and Telangana (2014)—appear to perform better than their parent states—Madhya Pradesh, Bihar, Uttar Pradesh, and Andhra Pradesh. Among the parent states, three—Madhya Pradesh, Bihar, and Uttar Pradesh—are grouped in Quadrant III (low AHDI and AWEI), while Andhra Pradesh falls in Quadrant IV (high AHDI and low AWEI). The newly formed states show varied progress: Telangana and Uttarakhand are grouped in Quadrant I (high AHDI and AWEI), while Chhattisgarh is placed in Quadrant II (low AHDI and high AWEI). This indicates differentiated developmental trajectories for the newly created states relative to their parent states. Moreover, the newly formed states, except Telangana, reported lower TFRs than their respective parent states. For instance, Uttarakhand (1.85) fares better than Uttar Pradesh (2.35), Chhattisgarh (1.40) outperforms Madhya Pradesh (1.99), and Jharkhand (2.26) shows improvement over Bihar (2.98). However, Telangana (1.75) has a slightly higher TFR than Andhra Pradesh (1.68). A recent study, using over three decades of macro-panel data, found that while the state of Uttarakhand exhibited significantly higher growth

compared to its counterfactual in the post-reorganisation period, the other two smaller states, Bihar and Chhattisgarh, experienced faster growth than their counterfactuals but did not meet the threshold for statistical significance. The study concluded that creating smaller states may not be a universal solution to their economic challenges [95].

Overall, a strong positive correlation (0.8) between the AWEI and AHDI at the sub-national level indicates the importance of women's empowerment to achieve human development and vice versa. However, the absolute values of the index scores paint a somewhat dismal picture of the status of human development and women's empowerment in India. The correlation of TFR with AWEI and AHDI in India suggests that achieving replacement-level fertility nationwide could bring significant benefits, such as alleviating pressure on resources and enabling greater investments in human development. However, the sustenance of below-replacement-level fertility for longer periods may also pose future challenges in managing an increasingly ageing population and ensuring a continuous labour supply for macro-economic growth. India's demographic dividend, driven by a large and youthful working-age population, is not a permanent advantage, and the country is predicted to undergo a significant demographic shift in the coming decades, with its national TFR projected to fall to 1.29 by 2050 [96]. This predicted drop in fertility levels could lead to a rapidly ageing population, with one in five Indians expected to be over the age of 60 by mid-century. This is also witnessed in some high-income countries, such as Japan and Italy, where fertility has remained below replacement level for decades, and declining birth rates pose challenges to labour markets and social security systems.

Thus, achieving balanced fertility levels across states, while advancing women's empowerment and human development, will be critical for India to sustain its demographic dividend, address persistent inequalities, and prepare for the long-term challenges of population ageing.

WOMEN'S AGENCY, EMPLOYMENT, AND FERTILITY: INSIGHTS FROM AN INDIVIDUAL-LEVEL ECONOMETRIC ANALYSIS

This section presents an econometric analysis using structural equation modelling (SEM) with NFHS-5 unit-level data on currently married women aged 15-49 years. The analysis provides insights into the association between women's agency, workforce participation, and fertility. Table 17 presents the background characteristics of currently married women aged 15-49 years included in the overall sample of NFHS-5. The SEM used a sample of 54,224 currently married women, for whom data on all endogenous and exogenous variables were available.

The NFHS sample comprises 724,115 women, of whom 512,408 are currently married. Among the currently married women aged 15-49 years, the mean age was 38.5 years.

Exogenous variables used in the econometric model were categorised as per (a) household characteristics, including household size and socio-economic status (wealth index categories), and (b) individual characteristics, such as the respondent's age, social class, religion, educational status, place of residence, and use of modern contraceptive methods.

A large proportion of women (44.3%) live in households with 4 to 5 members, which is also the average household size in the Indian context (4.9, according to the 2011 Census). Thirty-eight percent of women belonged to households larger than the average Indian household. In addition, 18.8% belonged to the lowest economic strata.

An analysis of the individual background characteristics of currently married women aged 15-49 years reveals that 27.4% had no formal education, while 12.9% had attained higher education. A substantial majority (68.7%) resided in rural areas. Regarding social categories, 43.1% were from the Other Backward Classes (OBC), followed by 21.6% from the Scheduled Castes (SC). In terms of religious affiliation, 81.9% were identified as Hindu, while 13.2% were Muslim. Modern contraceptive methods were reported to be used by 56.4% of currently married women. Age distribution patterns show that the largest proportions were in the 26-35 (38.2%) and 36-49 (40.7%) age groups, while 21.1% were in the 15-25 age group.

Table 17:

Categorisation of major states based on AHDI

Background Characteristics	Estimated Distribution (%)	Sample Size
Household characteristics		
Members in a household		
1 to 3	17.1	87,377
4 to 5	44.3	2,28,060
6 to7	23	1,20,663
Greater than 7	15	76,308
Wealth Index categories		
Poorest	18.8	1,07,924
Poorer	20	1,12,848
Middle	20.4	106,285
Richer	20.8	98,260
Richest	20.1	87,091

Background Characteristics	Estimated Distribution (%)	Sample Size
Individual characteristics		
Usage of modern contraceptive method		
No	43.6	232,437
Yes	56.5	279,971
Social caste category		
Scheduled Caste	21.6	98,743
Scheduled Tribe	9.2	91,976
Other Backward Class	43.1	199,267
None of them	20.4	94,500
Do not know	0.8	3,176
Missing	4.9	24,746
Highest educational level		
No education	27.4	146,923
Primary	13.8	71,907
Secondary	45.9	236,574
Higher	12.9	57,004
Religious composition		
Hindu	81.9	393,073
Muslim	13.2	61,829
Christian	2.2	33,227
Religious composition		
Sikh	1.6	11,446
Others	1.2	12,833

Background Characteristics	Estimated Distribution (%)	Sample Size
Place of residence		
Urban	31.3	122,046
Rural	68.7	390,362
Age groups		
15-25 years	21.1	1,04,03
26-35 years	38.2	1,97,33
36-49 years	40.7	2,11,04
Total	**100**	**5,12,408**

Source: NFHS-5 unit level data, 2019-2021. Note: Percentage distribution presented in the table is a weighted estimate

ASSOCIATION BETWEEN WOMEN'S AGENCY, WORKFORCE PARTICIPATION, AND FERTILITY

The results of the SEM indicate a statistically significant association between women's agency, workforce participation, and fertility, even after accounting for the influence of various exogenous factors on these endogenous variables. A significant non-recursive or bidirectional association among these three variables suggests that any two of them can act as determinants of the third. For analysis and interpretation purposes, ***Table 18*** presents the key findings of the model, specifically focusing on the relationships among the endogenous variables. Comprehensive model results are detailed in Annexure ***Table A9***, while Annexure ***Table A10*** provides the correlation matrix of the variables along with their standard deviations.

Table 18:

Coefficients and odds ratios for three endogenous variables considering non-recursive relationships among them in the Econometric Model (GSEM)#

Dependent	Independent	Coefficient	Odds Ratio
Women's Agency	Workforce Participation	1.03***	2.80
Workforce Participation	Women's Agency	-0.04***	0.96
Women's Agency	Fertility	0.47***	1.59
Fertility	Women's Agency	-0.26***	0.76
Workforce Participation	Fertility	0.13***	1.15
Fertility	Workforce Participation	-0.67***	0.50

 # Complete results of the model, including all endogenous and exogenous variables, are provided in Appendix Table A6.

RELATIONSHIP BETWEEN WOMEN'S AGENCY AND WORKFORCE PARTICIPATION

The results of the econometric model reveal that, as per the initial hypothesis, there exists a significant non-recursive association between women's workforce participation and agency in India. Workforce participation shows a strong positive association with women's agency after controlling for individual and household characteristics. The analysis further suggests that, holding these characteristics constant, working women are more than twice as likely to report higher levels of agency than those who are not working (***Table 18***).

This aligns with findings from multiple studies across countries, which highlight that increased women's participation in paid work plays a crucial role in enhancing their agency and intra-household bargaining power. When women work, they have greater control over their lives, increased bargaining power, and contribute to improved educational outcomes for children [88, 97, 98]. Another study by the ILO found that access to paid employment in rural India has a positive and significant effect on women's control over household decisions [99].

At the same time, the negative coefficient in the reverse relationship, i.e., the effect of women's agency on workforce participation, indicates that as women's agency increases, the likelihood of participating in the workforce decreases slightly. For every unit increase in the women's agency index, the likelihood of employment decreases by 5%. However, the impact is minimal (-0.04).

Thus, the effect of agency on workforce participation is less pronounced. Overall, it is found that while workforce participation increases women's agency, higher levels of agency do not necessarily lead to increased work participation. In this context, it is important to note that agency is conceptualised using indicators that determine agency within the household, including decision-making, mobility, use of a contraceptive method, experience of violence, and having one's own money. However, the presence of these factors cannot solely lead to gainful employment or participation in the labour force.

The literature suggests that women's workforce participation is influenced by a range of interrelated factors, including socio-cultural norms, economic structures, environment and policy frameworks [46, 100-102]. Key determinants include access to education and skill development opportunities, which equip women with essential skills for workforce participation and make them market-ready [101]. The presence of gender-responsive policies, such as paid maternity leave, childcare facilities, flexible work options and anti-discrimination laws, is vital in fostering an inclusive and supportive work environment [103, 104]. Additionally, the accessibility of respectful, stable employment opportunities, along with a conducive economic environment that offers fair wages and career growth prospects, plays a significant role [105]. Societal expectations surrounding gender roles and women's domestic responsibilities, gendered occupational segregation, and unequal access to resources can impact their participation [106, 107].

"Employment drives women's agency in India, but higher agency alone does not guarantee workforce participation, underlining the structural barriers that persist beyond individual control."

In the context of women's agency, education is often regarded as a critical proxy indicator. Previous studies suggest that women with higher levels of education may decline employment opportunities that do not align with their aspirations. At the same time, the labour market lacks sufficient salaried opportunities, such as clerical and sales roles, for women with moderate levels of education [108]. Furthermore, jobs perceived as low-skilled are often considered unaspirational by women with medium to high educational attainment. Addressing this challenge requires concerted efforts to dismantle stigmas associated with certain job roles, particularly those categorised as menial, such as positions in manufacturing, construction, or domestic services [109].

In her pioneering research, Nobel Laureate Claudia Goldin challenged previous economic assumptions by demonstrating that economic growth, in isolation, does not necessarily drive increased female workforce participation. She highlighted the historical example of industrialisation, during which women's participation in the labour market actually declined as new industrial jobs became less accessible to them. However, with the expansion of clerical work in the 20th century, the acceptance of women's participation in the workforce grew, facilitated by the dismantling of social barriers such as discriminatory legislation against married women's employment. Goldin further emphasised that significant advancements, such as the advent of the birth control pill, contributed to a rapid rise in female workforce participation. She also identified the work culture, characterised by long hours and inflexibility, as a critical factor in perpetuating the gender pay gap [110].

In the Indian context, women's workforce participation is explained by many other factors outside the purview of empowerment, such as the 'income effect' (increase in household income) and 'education effect' (women staying longer in educational institutions). The existing literature indicates that a household income effect may contribute to women's withdrawal from the labour force, driven by factors such as husbands' income and education levels. Studies suggest that higher household income, apart from women's individual earnings, reduces the likelihood of women participating in the labour force

[111-113]. Similarly, if women perceive their productivity in domestic activities to exceed their potential returns in the labour market, they may opt to prioritise unpaid household responsibilities over formal employment [114]. However, a significant limitation in understanding this dynamic is the lack of comprehensive data in national surveys distinguishing family income from women's personal earnings. Afridi, Dinkelman, and Mahajan (2018) identified both income and education effects as significant factors influencing married women's labour force participation in rural India. Their study highlighted that rising education levels among rural married women, as well as among men in their households, were key contributors to the decline in female labour force participation [115]. Apart from these effects, sexual violence or fears for personal safety, as well as a rise in conservative sentiments, stigmatise women's work outside the home, also impacting women's workforce participation [116].

The lack of participation could result from the unavailability of adequate work compatible with household duties, family structure, education level, and employment preference [117]. On the other hand, empowered women might choose not to work outside the home due to many socio-cultural norms or because they have access to other sources of income [118].

We recognise that although the GSEM model controls for several observed confounders such as education, age, wealth, residence, social group, and religious affiliation, unobserved factors, including individual motivation, localised socio-cultural norms, and unmeasured family support, may also shape both workforce participation and agency, and could therefore contribute to estimates.

The above discussion highlights the complex and nuanced relationship between women's agency and workforce participation, shaped by an interplay of individual, household, community, and systemic factors. While workforce participation can undoubtedly advance women's agency by enhancing their economic independence and social visibility, women's agency does not always translate into increased workforce participation due to the multifaceted factors outlined in the above literature review.

RELATIONSHIP BETWEEN WOMEN'S AGENCY AND FERTILITY

Within the framework of association between fertility and women's agency, the findings present a nuanced contradiction. Women's agency is negatively associated with fertility, indicating that empowered women tend to have fewer children, while fertility is at the same time positively associated with women's agency. This dual association highlights the complexity of the interplay between the two variables.

The econometrics analysis shows that for every one-point increase in the agency score, the likelihood of having children decreases by 24%. This suggests that women with higher agency are more likely to have control over reproductive decisions and access to contraceptives to delay pregnancy, limiting the number of children they want to have or opting out of motherhood.

In an earlier study of 53 low- and middle-income countries (LMIC), using data from 2006 to 2018, it was found that familial empowerment, as measured by household decision-making, enhances women's ability to achieve their desired fertility. Such indicators are also associated with a low ideal number of children [119]. The negative association between empowerment and fertility in the context of developing countries is primarily shaped by the viewpoint that with reproductive agency, women tend to prefer fewer children to align with their social and economic aspirations. In a comprehensive review of 60 studies, predominantly from South Asia (35 studies), Upadhyay UD. Et al. (2014) identified a general trend indicating positive associations between women's empowerment and outcomes such as reduced fertility, longer birth intervals, and lower rates of unintended pregnancies [9]. However, the findings also showed variability, influenced by differences in empowerment measures and the socio-political or gender context. In a more recent review of 80 studies, Shireen J. Jejeebhoy and Zeba Sathar (2024) emphasised that, even after controlling for

other variables, women's agency continues to have a significant impact on contraceptive outcomes [120]. Similarly, a systematic review by Chowdhury S. et al. (2023) on the role of women's empowerment in shaping fertility and reproductive health in Bangladesh found an inverse relationship between women's empowerment and fertility, alongside a positive correlation with improved reproductive health outcomes for women [121].

Contrary to the hypothesised negative association between women's agency and fertility, the analysis reflected that fertility has a positive association with women's agency. In other words, each additional child increases the likelihood of increased agency by 59%.

The positive association between fertility and women's agency can be understood through the interplay of various socio-economic and cultural factors. Empowered women, particularly those with access to education, healthcare, and economic resources, may choose to have more children as a demonstration of agency and reproductive autonomy, especially in contexts where childbearing is closely tied to social status or economic security [38]. Upadhyay and Karasek's 2012 study further highlights that women with greater decision-making authority and more equitable gender attitudes have the agency and resources to act on their reproductive decisions. In some contexts, empowered women may align with societal expectations of high fertility, even if they personally prefer smaller families. However, these findings must be interpreted within the specific national and cultural context, as in some settings, women with larger families may gain greater social recognition and household influence [38]. A significant segment of Indian society exhibits similar socio-cultural dynamics, wherein deeply embedded factors—including patriarchal structures, son preference, the prioritisation of family lineage, religious influences, and the perception of children as a source of social security in old age—collectively shape fertility choices and family size. Societal norms that support the preference for sons in families and view children as economic assets, particularly in low-income families, perpetuate fertility rates. Additionally, low-income families in most states place significant value on having more children, especially sons for labour support in agrarian contexts [29]. Caldwell's (1982) theory holds that in less developed rural economies, children are seen as social and economic resources [122].

This is complemented by the idea that women are seen as fulfilling their gender roles by giving birth to more children, especially sons. Bose & Das (2024) also find that the relationship between women's empowerment and their fertility decisions cannot be generalised and depends on the study's setting [123].

A previous Indian study using NFHS data highlighted a gradual shift in the India Patriarchy Index over time, revealing significant variations in patriarchal practices and index scores across caste, religion, and residential settings [124]. In patriarchal settings, empowerment initiatives may inadvertently strengthen women's bargaining power within households, allowing them to negotiate for desired family sizes, which may sometimes align with higher fertility [2]. Similarly, women with son(s) are more likely to have a significant say in household decisions on daily expenditures, go on outings, shop more frequently, and have more cash in hand to spend than women with no sons [125]. On the contrary, in a panel-based study conducted in Uttar Pradesh and Bihar, the authors found no statistically significant impact of having at least one son compared to having daughters on empowerment in terms of freedom of movement, intrahousehold decision-making, and access to economic resources [126]. Despite prevalent norms favouring sons in the country, there is mixed evidence on whether this preference leads to greater bargaining power for women within the household, which explains the complex nature of these relationships.

"While women with higher agency tend to have fewer children, having more children—paradoxically—appears to increase women's agency and status, revealing the complex social value and identity tied to motherhood in the Indian context."

Studies have also shown that empowerment can increase women's confidence in accessing maternal health services, reduce infant mortality rates, and encourage subsequent childbearing [127]. Furthermore, in cultural contexts where larger families are valued, empowered women may opt for higher fertility to balance personal agency with socio-cultural expectations [38]. Earlier research on the relationship between economic empowerment and fertility decisions has highlighted that, from both theoretical and empirical perspectives, women may choose to have more children as a strategy to secure economic support

in old age. [128, 129]. Aletheia Donald et al. (2024) examined six programmes in Africa (Benin, Ethiopia, Ghana, Rwanda, and Togo) and found that women who earned more or received land were more likely to have more children. It was not because women gained more influence in household decisions, nor simply because they wanted more helpers for farming or business. Instead, women appeared to use childbearing as a strategy to secure their future. Having sons, in particular, increased their chances of keeping access to land and income in old age. Fertility rose most for women without sons, or for those at higher risk of losing land to a husband's relatives [130].

The study's findings and corresponding discussion, based on the published literature, highlight the interplay between women's agency and fertility decisions, contingent on socio-cultural and institutional factors. On comparing the two non-recursive relationships, it was found that the magnitude (coefficient) of the positive association of fertility on women's empowerment is somewhat greater than the negative association of women's empowerment on fertility. The findings of the model reveal a complex relationship between fertility and women's empowerment, partly proving the third hypothesis inconclusive: that lower fertility leads to higher women's agency.

RELATIONSHIP BETWEEN WORKFORCE PARTICIPATION AND FERTILITY

The findings validate one of the hypotheses, indicating that higher women's workforce participation is associated with lower fertility, assuming all other exogenous variables remain constant. However, the analysis does not substantiate the other hypothesis, which posits that lower fertility rates are linked to higher workforce participation, even after adjustments for women's agency and other exogenous factors.

On average, the number of children born to working married women is 50% lower than that of married women who are not employed. This aligns with the literature, which suggests that as women gain employment, they are likely to have fewer children to manage time, and support their career aspirations [131]. In economies with a negative relationship between individual fertility and workforce participation, economists offer two plausible explanations for these behaviours. First, the quantity-quality trade-off: as parents get richer, they want to invest more in their children's quality (education). Secondly, the time allocated to raising children is relatively high. As wages increase, spending time on childcare instead of working becomes increasingly costly for parents, especially mothers. Women's workforce participation increases the opportunity cost of marriage and childbearing. Such women have greater agency to relocate household resources for their children and it is a direct consequence of having their own money. A recent global study analysing data from 1960 to 2015 found a negative correlation between women's wage employment and total fertility rates [132].

The study findings further reveal a significant positive association between fertility and women's workforce participation. For married women, the likelihood of employment increases by 15% with each additional child.

This relationship may be influenced by a combination of factors, including economic pressures, larger family sizes, and the nature of available employment opportunities, compelling women with more children to enter the labour market. The need for additional income to cover childrearing costs pushes women into the labour market, especially in households where dual income is seen as a necessity [133]. This finding challenges the common belief that higher fertility limits women's work participation. A closer examination of the occupations held by working women, as reported in NFHS-5 (2019-2021), sheds further light on these dynamics. Women with higher fertility rates (three or more children) are predominantly employed in agricultural work or low-skilled and unskilled manual labour. Women in such jobs are mostly from economically disadvantaged groups, under pressure to support larger families. In contrast, women with two or fewer children are more likely to be employed in professional, technical, or managerial roles, which typically require higher levels of educational attainment and offer better pay and working conditions.

This indicative relationship between occupational categories and fertility may partially explain the positive association observed between fertility and women's workforce participation. Published literature also highlights that, globally, a significantly higher proportion of women's employment compared to men's is concentrated in agriculture [134]. Such employment is often less effective in transforming women's preferences or enhancing their bargaining power within households and communities. A global study using panel data from 1960 to 2015 found that, in the pooled model across all regions, women's agricultural employment is positively associated with TFR, whereas women's non-agricultural employment is negatively associated with TFR. The general pattern of a positive correlation between agricultural employment and TFR and a negative correlation between non-agricultural employment and TFR is also echoed in the region-specific analyses [132]. Additionally, other studies have also found links between social identities, such as caste and religion, and women's participation in the workforce in India. Women from marginalised social groups are over-represented in low-paying, informal and manual labour sectors. Employment for such women often stems from survival needs rather than empowerment. Even though upper-caste women also face challenges in workforce participation due to household and caregiving responsibilities, when they do work, they often have access to professional and formal employment, unlike their SC/ST counterparts [135, 136]. Therefore, marginalised women's participation in the workforce could be shaped by both economic compulsion and systemic inequalities.

"Cross-sectional analysis shows that women's workforce participation is associated with lower fertility, while higher fertility is linked with a greater likelihood of work, often due to economic necessity; this reflects short-term dynamics and may differ from the longer-term trend where declining fertility supports women's labour force participation."

However, as the analysis suggests, the magnitude of this association between fertility and workforce participation is relatively smaller than that of the reverse association between workforce participation and fertility. Still, it is interesting to note that the economic compulsion to work in the context of large families overpowers other barriers, such as time constraints, inadequate child support, and norms that otherwise hinder workforce participation. Therefore, while the analysis establishes a bidirectional association between fertility and workforce participation, the stronger effect is the negative association between workforce participation and fertility.

Overall, women's employment is associated with a preference for smaller families to balance work and caregiving, while larger family sizes, combined with socio-cultural inequalities, are linked with women's entry into the labour market, often out of economic necessity. These patterns reflect associations rather than causal effects.

SOCIO-CULTURAL DYNAMICS SHAPING REPRODUCTIVE AUTONOMY, WORKFORCE PARTICIPATION, AND WOMEN'S EMPOWERMENT

The interplay between population dynamics, women's empowerment, and workforce participation is multifaceted and shaped by socio-cultural norms, resource access, and structural barriers that affect women's reproductive autonomy, decision-making power and control over their lives.

As the United Nations Population Fund's (UNFPA) Status of the World's Population (SWOP) report (2021) highlights, "A woman who has control over her body is more likely to be empowered in other spheres of her life"[137].

India, home to the world's largest young population and with women comprising half its population, stands at a critical juncture. Empowering women and improving workforce participation can unlock its demographic and gender dividend. However, entrenched gender norms and socio-cultural customs remain significant barriers, deeply influencing India's demographic and development trajectory.

The quantitative findings reveal how these complex, interrelated factors impact women's empowerment, workforce participation, and fertility at both macro and micro levels. Complementing this, the findings from qualitative research in rural, urban, and peri-urban areas in Uttar Pradesh, Bihar, and Delhi reinforce that rigid, patriarchal socio-cultural norms remain a significant barrier to gender equality, with societal and familial expectations limiting women's decision-making and aspirations. These expectations, imposed both overtly and subtly, restrict women's reproductive autonomy and choices related to education and workforce participation. In the subsequent section, findings from an in-depth analysis of qualitative interviews using vignettes with adolescent girls and young women are presented:

IMPACT OF SOCIAL NORMS ON WOMEN'S EMPOWERMENT, WORKFORCE PARTICIPATION, AND FERTILITY

The literature highlights how gender-biased practices like early marriage, early pregnancy, limited reproductive autonomy, and son preference significantly shape population dynamics in India [138]. These norms lead to higher fertility rates, skewed sex ratios, and poor health outcomes for women and children, especially in the states where these practices are widely prevalent [139, 140]. Adolescents and young women experience societal pressures differently. For adolescents, the early internalisation of gender norms begins as they observe unequal distribution of caregiving responsibilities between boys and girls. Transitioning from adolescence to youth often results in reduced mobility and heightened caregiving duties for young women, with key decisions concerning their education, marriage, and reproductive choices typically made by male family members. In contrast, young women face the challenges of balancing household responsibilities with professional aspirations [141].

A young woman from Lucknow, Uttar Pradesh shared,

"In villages, if a girl goes with a man, her character is questioned. Even going with a brother risks reputation."

Similarly, another young woman from Lucknow, Uttar Pradesh reflected on the weight of societal expectations, noting,

"Parents and relatives nudge to get married after getting a job; society expects women to bear children."

The expectation to conform to traditional roles as daughters and daughters-in-law is particularly pronounced, further limiting their ability to pursue education or employment. According to the ILO, societal norms disproportionately place caregiving responsibilities on women, preventing their active participation in the formal workforce [142]. Despite significant development, a vast majority of women, particularly in rural and peri-urban areas, remain constrained by patriarchal norms that restrict their agency over reproductive decisions.

SOCIETAL PRESSURES AND FERTILITY EXPECTATIONS IN MARRIAGE

The consequences of early marriage are profound. Young brides are often denied autonomy in deciding the timing, spacing, and number of children, contributing to higher fertility rates and poor maternal and child health outcomes. According to various studies, women married as minors are more likely to experience unintended pregnancies, limited use of contraception, and exposure to intimate partner violence (IPV) [143-147]. These factors collectively undermine their dignity, reproductive autonomy, and career aspirations, perpetuating a cycle of poor health, deprivation, and poverty.

Study findings reveal that socio-cultural norms significantly

influence women's reproductive choices and roles, often linking their worth to fertility and motherhood. Many societal narratives perpetuate the idea that a woman is not 'complete' until she becomes a mother, creating immense pressure to prioritise childbearing [148]. These expectations often manifest through societal and familial scrutiny, leading to psychosocial stress and social stigma for women unable or unwilling to conform. As a result, these pressures erode women's self-esteem and limit their agency.

Respondents from the peri-urban and rural areas of the study shared that societal pressures often compel them to prioritise childbearing immediately after marriage. They reported intense scrutiny by family members, particularly in-laws, regarding their fertility, often leading to forced medical interventions without their consent and unwanted health consequences.

A married, adolescent girl from Lucknow, Uttar Pradesh shared,

"After a couple of months, people started asking why I am not pregnant yet...They put pressure on me to have a child...I might have a son, but I don't want to."

A married woman from rural Uttar Pradesh shared,

"My husband is the only son, so I was pressured to conceive after six months of marriage. My in-laws were worried and assumed that I might have some underlying health condition leading to infertility. They forced me to seek medical treatment, but later the doctor informed me that I was fine. My husband also made unkind remarks till we had our son after four years of marriage. All this while, assumptions about my infertility subjected me to unwarranted fertility treatments."

Similarly, a married woman from rural Bihar shared,

"Couples without children are labelled childless, ridiculed, and are pushed into unnecessary medical interventions. It is always a woman who is blamed for delays in childbearing."

Though most study respondents shared that they wanted to delay their first pregnancy, constant societal pressures and concerns about fertility push women to conceive immediately after marriage.

A young woman from urban Delhi shared,

"In my society, women keep asking me how many years I have been married … I lie to these people. People around me started bullying me."

Understanding from the lived experiences of study respondents, societal pressures in rural and peri-urban settings compel young women to conform to traditional reproductive norms, including early marriage and immediate childbearing. The cultural norms place a high value on procreation, any resistance to which leads to blame regarding the inability to conceive. Various studies confirm that the fear of negative consequences stemming from societal expectations significantly influences women's choices [149-152].

"Early marriage undermines women's reproductive autonomy–forcing childbearing decisions through societal pressure and patriarchal control, while education and economic independence remain the clearest pathways to reclaim agency."

Published literature indicates that higher levels of education equip women with enhanced decision-making abilities, while economic independence strengthens their bargaining power within households [153-157]. This reinforces the importance of education and financial inclusion as key drivers of empowerment and collaborative decision-making. The study found that urban women were comparatively more empowered due to better access to education and healthcare, but they were not completely immune to patriarchal control. Women respondents from urban areas also faced societal pressures to conform to traditional roles, albeit in subtler ways, impacting their ability to exercise full reproductive autonomy.

LINKAGES BETWEEN EDUCATIONAL OPPORTUNITIES AND WOMEN'S EMPOWERMENT

Education and skill-building are critical enablers of women's empowerment, with ripple effects extending to workforce participation and population dynamics. Studies indicate that women who completed secondary or higher education were more likely to delay marriage and childbearing, join the formal workforce, and exercise agency in household decision-making [10, 158]. Education empowers women to make decisions across all aspects of life, including career, family, and household management. For example, women with secondary or higher education were found to have a greater influence on household financial decisions, as highlighted by NFHS-5. Furthermore, educated women often delay marriage and childbearing, allowing them to focus on professional development and gain economic independence. These factors, when combined, enhance their ability to negotiate within familial structures, contributing to better outcomes in family planning and child education decisions. Gender-biased socialisation and the division of labour, however, perpetuate the notion that men are 'providers' and women are 'caregivers', diluting the importance of work for women and its linkages with empowerment. These norms often result in girls internalising reproductive roles as their primary responsibility over attaining education, further limiting their negotiating power and opportunities.

The study's findings also emphasised that gender-biased norms and structural barriers impede women's access to education, particularly at the secondary level. Deeply ingrained socio-cultural traditions and financial constraints often prioritise male education. This is especially evident in rural areas, where poverty and customary practices reinforce the belief that investing in a girl's education is unnecessary. Various studies highlight how cultural expectations often lead to early withdrawal of girls from schools and push them into child marriages [159-161]. NFHS-5 indicates that 23% of women in India were married before the legal age of 18, with a higher prevalence in rural areas (27%). Early marriage not only curtails education but also limits a woman's ability to make informed reproductive and sexual health decisions, restricts

her economic opportunities, and increases her vulnerability to health risks and gender-based violence.

Study findings describe key factors contributing to women dropping out of school, especially at the secondary level, which include financial challenges, safety concerns during travel, pressures of early marriage, and lack of family support.

An adolescent girl, from rural Uttar Pradesh shared,

"My grades in school were better than my younger brother's, yet he continued his studies, unlike me."

A young married woman from rural Uttar Pradesh shared,

"I have not studied much. After passing fifth grade, I did not feel like studying, so I stayed home and did household chores. Later, my parents decided to marry me at a young age since the environment was unsafe for girls in those days."

However, many young women respondents of the study expressed regret over missed educational opportunities, recognising the link between education and empowerment.

An adolescent girl from New Delhi shared,

"If I get a chance, I would like to complete my studies."

Similarly, another adolescent girl from rural Uttar Pradesh reflected on the role of family support in shaping educational opportunities, stating,

"With parents' support, 'You can become anything'. I would have studied if the environment were good."

A young woman from rural Uttar Pradesh, who dropped out of school due to financial hardship and the pressure of marriage, shared,

"I regret dropping out of school. I wanted to study, but my father forced me to get married at 18. I didn't get support from anyone, but I am now advocating for the education of my younger siblings with my parents and encouraging them to study hard."

In rural areas, the emphasis on domestic skills over academic achievements reinforced gendered expectations. The study's findings showed that at times, the decision to drop out of school may stem from young girls' lack of understanding of the benefits of education for their future, leading to a lack of interest in education. Study respondents also highlighted the transformative impact of parental support, with some families championing education as a pathway to empowerment. The study observed that respondents who received support and encouragement from their parents to pursue education and become financially independent exhibited notable confidence and were more vocal in expressing their opinions.

> **An unmarried adolescent girl from rural Uttar Pradesh shared,**
>
> *"Our primary aim was to study and become independent. My father placed great importance on education, which also inspired his brothers to educate their daughters. Education is the most essential tool. But most families in my community think otherwise. Even if a girl wants to study, her family will not let her study much. Instead, they encourage young girls to stay at home and take care of household chores and younger siblings."*

Research studies also support the important role of parents, families, and society at large in encouraging women to pursue higher education, thereby strengthening their societal position and bargaining power [162].

"Education and employment opportunities delay marriage, expand choices, and strengthen women's bargaining power– yet gender norms and structural barriers continue to pull girls out of classrooms, workforce, and into early domestic roles."

LACK OF AWARENESS ABOUT REPRODUCTIVE HEALTH AND FAMILY PLANNING METHODS

Findings from the study showed that women in urban areas benefit from greater access to information and decide on family planning collaboratively with their husbands. Whereas, in contrast, rural women often lack the information and ability to make decisions about childbirth and contraceptive use.

Respondents in rural areas reported that they had very little knowledge about family planning and modern contraceptive methods, which resulted in early or unwanted pregnancies. Young married women shared that their primary sources of information about sexual behaviour, reproductive health, and contraception were their mothers, friends, neighbours, and mothers-in-law, who themselves had very limited knowledge. Consequently, several prevailing misconceptions about the adverse effects of modern contraceptives discouraged women from using modern methods.

> **A young married woman from peri-urban Uttar Pradesh shared,**
>
> *"I knew about Copper-T but feared that if I used it, I would be unable to bear children in the future. Therefore, I dropped the idea."*

Similarly, verbal accounts of unmarried adolescent girls across different settings highlighted a lack of awareness regarding the importance of reproductive and sexual health and family planning. Most adolescent respondents in the study believed this information was necessary only after marriage.

An adolescent girl from an urban district of Uttar Pradesh shared,

"One should know about contraceptives only after marriage. If we talk about it before marriage, then what will our family members think? They will question us as if we are thinking of a child before marriage."

Another married young woman from Uttar Pradesh shared,

"It is up to the family. Some allow you to take your time, some force you."

The study highlighted that there is an associated shame and embarrassment around issues related to conception and contraception. The absence of comprehensive reproductive health and family-planning education from an early age was a recurring theme across various geographical locations, highlighting its critical role in enabling young women to make informed choices about their bodies.

A married woman from peri-urban Uttar Pradesh shared,

"I keep watching videos on my mobile phone and attending lectures about health and hygiene for the household, women, and children."

Similarly, an adolescent girl from rural Uttar Pradesh shared,

"If both of us are in agreement, then it is okay. If the husband also chooses to listen to his family members, then the wife will be left alone."

The study finds that women in peri-urban areas had basic knowledge of contraceptive methods, understood the importance of health and hygiene, and discussed the same with their family members. Several factors, such as urbanisation, access to mobile phones and the internet, and the increased availability of media and technology channels, have enhanced information access for women residing in urban and peri-urban areas.

A married young woman from New Delhi reflected on the reproductive choices as a collaborative process, grounded in mutual understanding and shared values with their husbands,

"It is neither the man's nor the woman's decision alone. Whether the woman is ready, mentally stable and ready to face things that come with having a child is important to the decision. I myself am taking a lot of time."

The shared experiences highlight that, compared with rural settings, peri-urban and urban respondents were better placed to discuss family planning with their husbands. Young married women valued making their own decisions, but they could do so only with their husbands' support, which helped them cope with the pressure to become mothers early.

Elaborating on the challenges of accessibility, young married women in urban areas shared that associated stigma and embarrassment discouraged them from buying contraceptives by themselves from the market and were largely dependent on their husbands.

A young married woman from rural Uttar Pradesh further elaborated,

"I do not go out of the house. My husband gets it whenever he can. What will people think if I go outside and buy?"

"Access to information shapes reproductive choices and autonomy–but in rural settings, silence, stigma, and misinformation continue to deny women control over their own fertility."

LINKAGES BETWEEN WOMEN'S WORKFORCE PARTICIPATION, FERTILITY, AND EMPOWERMENT

Women's economic empowerment is a key factor in defining women's empowerment, as highlighted in various other documents [163-165]. The study also identified economic independence as a pivotal factor in enhancing women's autonomy. Financially independent women were better equipped to challenge traditional norms and negotiate their roles within the family. This was particularly evident in decisions related to marriage and childbirth.

A young woman from rural Uttar Pradesh shared,

"For me, earning is important because it helps in running the household. While my husband may cover some external expenses, I feel I should contribute as well. I also work because I enjoy teaching and want to share my knowledge with students so that they can study further. But I prefer to manage with what we have, and I don't like taking loans, as borrowing only creates stress when it comes time to repay."

A married young girl from rural Uttar Pradesh shared,

"If a girl works, then she can do whatever she wants .. if not, then her wishes are compressed inside."

Contrary to that, a married woman from Uttar Pradesh shared,

"Many women endure violence from their husbands, but they cannot leave an abusive marriage as they have nowhere to go. They do not have any skills to work."

In peri-urban and rural areas, although many women recognise the importance of financial independence, their participation in paid work is driven by their husbands' unemployment or underemployment.

A married woman from rural Bihar shared,

"I started working because my husband was not doing anything. I had to step up to run the household, feed my children, and give them a good education."

These experiences reinforce the gender-biased norms where men are portrayed as 'providers' and women as 'caregivers', diluting the importance of the need to work for women and their linkages with empowerment. Working women across geographies shared that earning an income enabled them to delay pregnancy and negotiate shared household responsibilities. Economic empowerment not only provides women with a sense of agency but also challenges the patriarchal structures that often dictate their roles and responsibilities.

Few studies of urban middle-class families found that women who contributed financially to the household were more likely to participate in critical decisions about family planning, childbearing, and resource allocation [166]. However, the dynamics of conditional autonomy[xi] highlight the nuanced relationship between individual empowerment and collective norms. While financial independence empowered women to assert their choices, it also highlighted the need for systemic support to sustain these gains.

"When women earn, they gain the power to choose—but without skills, income, or support, many remain trapped in traditional roles defined by dependency and silence."

[xi] ***Conditional Autonomy:*** *An autonomy where a woman's agency is contingent upon her financial contribution.*

FACTORS RESTRICTING WOMEN'S WORKFORCE PARTICIPATION

Elaborating on the nature of workforce participation, the study has highlighted that women in peri-urban and rural settings are often drawn to the informal sector or to vocational skill development rather than to formal education. These skills and vocational jobs are often adorned to meet personal needs rather than to earn a livelihood, further limiting economic opportunities.

A young woman respondent from Uttar Pradesh mentioned that she learned tailoring to be self-reliant, as she was told that she should have this skill. She shared,

"I learned tailoring for myself to save money. One must have this skill for themselves. So, I learned it."

A married woman from the peri-urban area of Uttar Pradesh shared,

"The only work available here is domestic work or in the packaging industry nearby. I have searched a lot for work but did not find any. If there is work, it is at a distance, and travel is problematic. I also have to manage household chores; how will I manage everything if I get back from work late?"

Highlighting other factors, the lack of vocational training centres and mobility restrictions hinder women's acquisition of market-relevant skills, particularly in rural areas. While some women pursue traditional skills like tailoring, these are often limited to fulfilling domestic needs rather than entrepreneurial aspirations.

Urban women are increasingly engaging in diverse sectors; however, they still face challenges such as job insecurity and societal expectations.

A married woman from urban Uttar Pradesh shared,

"I am preparing for government service exams, such as police, SET, etc. Private jobs have no security. My husband and I are not okay with me doing a private job. He is all right with me setting up my work, but not a private job."

This sentiment was not isolated, as respondents reported that many women are inclined toward government jobs, valued for their job security, benefits, and social status, and also considered desirable by families.

The study's quantitative findings showed a positive link between fertility and workforce participation, largely because most women worked in the informal sector. Fertility was also positively associated with women's status in the family, influenced by deep-rooted socio-cultural norms. States like Bihar and Uttar Pradesh, where son preference and early marriage are common, exhibit a cycle of high fertility and low workforce participation. These states also score low on the AHDI and AWEI indices.

Likewise, the study's qualitative findings also reinforced that an individual's decision regarding marriage, family planning, caregiving, and workforce participation is shaped by societal norms and the expectations of their social circle.

The lived experiences of the study respondents focus on the key impact of rigid gender norms, burden of early marriage and motherhood on women's workforce participation.

A married adolescent girl from New Delhi shared,

"I feel bad that I cannot fulfil my dreams, and I am managing the household instead. If I had not married, I would have been employed in a good job and would have been caring for my family."

Also, a married woman from peri-urban Uttar Pradesh shared,

"My sister-in-law used to work before marriage, but then she married, got pregnant, and had to leave her job. Now she stays at home all the time."

Another married woman who had a strong desire to work shared,

"Even if I want to do something, my husband does not let me go out. He tells me to take care of the home and my one-and-a-half-year-old son. I think I will not be able to go out and work anymore."

The above responses highlight that marriage and motherhood often curtail women's workforce participation, particularly in rural and peri-urban areas. Most respondents reported leaving jobs due to childcare responsibilities or familial restrictions. The internalisation of rigid gender roles and the societal validation sought and received also play a critical role. The absence of shared domestic responsibilities further exacerbates this issue, emphasising the need for systemic changes to support women's dual roles as caregivers and earners. Respondents shared a rigid adherence to traditional gender roles, articulating sentiments such as, "How can a man do household chores?", or "I will never ask my husband to do household chores".

> **Likewise, a married woman from rural Bihar shared,**
>
> *"I do not get any help from anyone to perform household chores; I do it all by myself. Men in my community do not perform household chores; a woman's primary job is cooking and taking care of the household."*

"Marriage and motherhood often end women's work journeys before they begin– held back not by lack of aspiration, but by regressive social norms, unequal distribution of domestic duties and burdens, and the absence of supportive systems."

The findings confer that traditional gender roles and societal expectations, particularly regarding marriage, motherhood, and domestic responsibilities, significantly affect women's autonomy in terms of accessing higher education and career aspirations.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The study establishes the complex interlinkages among women's empowerment, workforce participation, and population dynamics in India's diverse socio-cultural and economic contexts. It highlights how empowerment and workforce participation impact fertility, reproductive autonomy, and access to reproductive health services, and vice versa.

The study developed two indices—the Adaptive Human Development Index (AHDI) and the Adaptive Women Empowerment Index (AWEI) to assess regional variations.

Given the significant variations across states and union territories, a negative correlation (-0.64) was observed between AHDI and TFR. Similar to the AHDI, the AWEI exhibited a moderately negative correlation (-0.5) with TFR. A strong positive correlation (0.8) was observed between AHDI and AWEI. Findings show that states with higher AHDI and AWEI scores tend to have lower fertility rates and higher female workforce participation, though structural and socio-cultural barriers continue to limit women's agency.

The Structural Equation Modelling (SEM) analysis using NFHS-5 unit-level data reveals bidirectional relationships between women's empowerment, workforce participation, and fertility. The modelling exercise assessed the association between endogenous variables at the country level, while accounting for a range of exogenous variables, understood as independent factors whose variation is determined by influences external to the SEM model. The findings reveal a significant interplay among endogenous variables, demonstrating that workforce participation positively impacts women's empowerment, with employed women being over twice as likely to be empowered. However, higher empowerment does not necessarily lead to greater workforce participation, indicating the influence of external factors. The analysis shows a negative relationship between fertility and workforce participation. Women in the workforce usually have fewer children, but economic pressures from larger families may push women to seek employment despite the barriers.

The findings validate the hypothesis, indicating that higher women's workforce participation is associated with lower fertility. However, the analysis does not substantiate the other hypothesis, which posits that lower fertility rates are linked to higher workforce participation, which can be linked to various socio-cultural factors.

Likewise, qualitative research underscores the deep impact of social norms on women's lives. Patriarchal expectations restrict reproductive choices, enforce early marriage and childbearing, and limit mobility and employment opportunities. Women, especially in rural and peri-urban areas, face strong familial resistance to working, particularly post-marriage and childbirth. Gendered socialisation further reinforces caregiving roles, often limiting educational and professional aspirations.

These findings highlight the urgent need for policy and programme measures that challenge restrictive norms, enhance skilling and economic opportunities, and ensure access to reproductive health services for true gender equality and reproductive justice.

Key suggestive recommendations are in the subsequent section.

RECOMMENDATIONS

1. **Strengthen Gender-Responsive Budgeting For Inclusive Development**

   Institutionalise and strengthen gender-responsive budgeting as a core strategy for inclusive development by expanding its adoption across all states and union territories, increasing fiscal allocations for women-centric schemes, and enhancing accountability through dedicated mechanisms, decentralised tracking, and outcome-based monitoring. The findings reaffirm the interlinkages between women's empowerment (AWEI), human development (AHDI), and population dynamics. To deepen and sustain these linkages, the Government of India should expand and institutionalise gender-responsive budgeting as a core strategy for inclusive development. The Gender Budget Statement (Statement 13 of the Union Budget) remains a critical tool for mainstreaming gender across policies and programmes. While 27 states and union territories have adopted gender budgeting [167], nine—Goa, Telangana, Haryana, Chandigarh, Meghalaya, Ladakh, Mizoram, Puducherry, and Sikkim—are yet to implement it [168]. These states and union territories should be supported in establishing gender budgeting frameworks to promote systematic review and planning from a gender lens. In addition to adoption, there is a critical need to ensure sustained, increased fiscal allocations for women-centric schemes, aligning budgetary commitments with the scale and depth of gender disparities. Although India did introduce a gender budget in 2005-06, in the 2025-26 Union Budget, 8.86% of total allocations were reported under the gender budget [169]. While this marks some progress, significant gaps remain in coverage, institutional capacity, accountability, and outcome tracking. Only 10 central ministries have allocated more than 30% of their budgets under the gender category [169]. To address this, gender budgeting should be strengthened through the establishment of 'Gender Budgeting Cells' in all ministries and departments with dedicated staff and training to facilitate the process. Additionally, decentralised state-level tracking and regular monitoring of Part A, B, and C allocations must be linked to outcomes in key sectors. Also, addressing current gaps in capacity, coordination, and accountability will be key to ensuring that gender budgeting drives intended results.

2. Advancing Women's Workforce Participation through Skills and Supportive Systems

Econometric analysis shows "workforce participation has a strong positive association with women's agency—working women are more than twice as likely to report higher levels of agency compared to those who are not working". Yet, the reverse association is weaker, with higher agency not translating directly into higher employment. Likewise, the qualitative findings indicated that women often acquire traditional skills that do not always translate into meaningful employment. The majority of women are engaged in the informal sector of the economy and bear a disproportionate burden of unpaid care work. Policies should therefore prioritise structural enablers of work—affordable childcare, safe transport, skill development linked to local markets, and financial inclusion. To address persistent gender gaps in employment, governments and employers must adopt age-responsive and context-specific strategies that support women's entry, retention, and advancement in the workforce. This includes expanding access to transition programmes, bridge courses, internships, and apprenticeships for young women; ensuring affordable childcare, paid maternity leave, safe lactation spaces, flexible work arrangements, and workplace safety measures; and operationalising sexual harassment redressal mechanisms as mandated under the PoSH Act (2013). For career advancement, women require access to second-career platforms[xii], leadership and entrepreneurship development opportunities, digital financial literacy, capital access, and structured mentorship networks. Such measures must be sensitive to intersecting barriers across caste, class, and geography. Union and state governments, donors, and corporates should invest in gender-responsive skilling, reskilling, and upskilling initiatives such as Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), Skill India Mission, the ILO's Women in STEM and Green Jobs Initiatives, Google's Internet Saathi (in partnership with Tata Trusts), Microsoft and NASSCOM Foundation's Women Empowerment Programmes – Women Wizards Rule Tech Program (W2RT), etc. Besides this, concerted efforts should

[xii] ***Second-career platforms*** *are initiatives or services that support individuals, especially women, who are returning to the workforce after a career break due to caregiving, childbirth, retirement, or other personal reasons for example www.tata.com/scip, HerSecondInnings, JobsForHer, and herkey. These platforms aim to match experienced professionals with flexible or re-entry opportunities and often provide reskilling or upskilling support.*

be made to address the rural-urban digital divide, aligning training with local market demand, and integrating soft skills, life skills, and digital literacy. Programmes such as Digital Infrastructure for Knowledge Sharing (DIKSHA), Study Webs of Active Learning for Young Aspiring Minds (SWAYAM), e-VIDYA, and Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) must be evaluated and scaled to ensure reach to marginalised communities.

3. Advancing Women's Leadership through Legislative and Programmatic Actions

The study found that women remain underrepresented in decision-making spaces, with most states scoring below 0.5 in the 'Participation in Decision-Making' dimension of AWEI. While India has achieved progress in local governance through reservation in Panchayati Raj Institutions, representation in higher political offices, the judiciary, and the corporate sector remains limited. Women hold only 13.6% of seats in the 18th Lok Sabha, 13% in the Rajya Sabha, and an average of just 9% in state legislative assemblies. Representation in the judiciary is similarly low, with women comprising only 9% of Supreme Court judges and 14% of High Court judges [170, 171]. In the corporate sector, women hold 28% of board seats, with limited influence at executive levels [172]. Advancing women's leadership requires going beyond mere representation to addressing structural barriers in both the public and private sectors. This must include: (a) Institutionalised capacity-building, inclusive appointments, strengthening mentorship and promotion pathways, and embedding gender accountability mechanisms; (b) Accelerating the enactment of the Women's Reservation Bill; and (c) Focusing on gender-inclusive policies, early mentorship, and accountability.

The Women's Reservation Bill (2023), proposing 33% seats for women in Parliament and State Assemblies, represents a significant legislative commitment. Its timely enactment into law remains essential to advancing inclusive political representation. To move from representation to leadership, targeted capacity-building for elected women representatives must be institutionalised. Ministries and state governments should take concrete measures to ensure the inclusion of women in senior leadership positions and high-level decision-making bodies and committees. This requires addressing structural barriers, such as limited access to mentorship and weak promotion pathways, by creating enabling conditions

that support women's leadership. It also involves addressing social barriers such as disproportionate burden of caregiving, family responsibilities, and gender stereotypes to facilitate their full participation.

In the corporate sector, efforts should focus on strengthening the implementation of gender-inclusive policies and fostering an inclusive work environment. This includes providing capacity-building and mentorship programmes from the early stages of women's careers, a need-based flexible work environment, developing leadership programmes grounded in feminist principles, raising awareness of gender biases, and institutionalising mechanisms to support women re-entering the workforce.

4. **Strengthening Reproductive Autonomy through Integrated, Gender-Responsive Approaches**

The econometrics analysis shows that for every one-point increase in the agency score, the likelihood of having children decreases by 24%. This suggests that empowered women are more likely to have control over reproductive decisions and access to contraceptives to delay pregnancy, limiting the number of children they want to have.

Advancing reproductive autonomy must be central to both policy and programme design to enable informed, voluntary choices and realise gender equality. But it cannot be realised without deliberate investments in both the systems that deliver reproductive healthcare and the environments that enable informed and voluntary decision-making. As highlighted in the UNFPA State of World Population Report 2025[xiii], women's ability to exercise agency over reproductive choices continues to be shaped by structural inequities, restricted access to services, and social norms that place limitations on autonomy. A transformative approach must reposition reproductive health not only as a component of healthcare but as a critical pillar of rights, dignity, and development. At the policy level, this requires embedding a reproductive autonomy lens across national and state health missions to deliver integrated, client-centred reproductive health services, including a full basket of contraceptive options, post-partum counselling, and safe abortion care. Expanding Mission Parivar Vikas's mandate beyond population stabilisation objectives to a gender-equity framework can significantly enhance its relevance and reach, especially given that,

[xiii] *UNFPA (United Nations Population Fund), 2025. "The Real Fertility Crisis: The pursuit of reproductive agency in a changing world." New York: UNFPA. ISBN: 9789211542837*

in certain states, fertility rates have already declined below replacement level.

Programmatically, this must translate into last-mile delivery models that centre the needs of young people, unmarried women, and those systematically excluded from the current health system. Scaling community-based outreach through Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs), expanding mobile health units, and ensuring that frontline workers are trained in contraceptive counselling centred on informed choice, respect, and agency is critical.

Reproductive autonomy cannot be advanced through service provision alone; it must be supported by a cross-sectoral ecosystem that recognises the linkages between health, empowerment, mobility, and economic security. Embedding these priorities into health planning, financing, and monitoring systems is essential not only to improve outcomes but also to shift the locus of control to women themselves.

5. Keeping Girls in School: A Strategic Imperative for Gender and Demographic Justice

Study findings highlight that states with higher AHDI also report stronger performance in knowledge outcomes. Kerala and Goa show the highest average years of completed education (10 years), while Goa and Delhi lead in expected years of schooling (15 and 14 years), nearing the 18-year benchmark. Bihar lags with only 8 years. On the AWEI education, skill-building and knowledge dimension, Goa, Himachal Pradesh, and Kerala perform better, supported by higher proportions of women completing secondary or higher education—Kerala (50%), Goa (45%), and Delhi (43%). In contrast, Bihar (0.32), Madhya Pradesh (0.34), and Odisha (0.34) remain at the bottom, with only 18% of women in Bihar and Madhya Pradesh completing secondary education. High NEET rates reflect persistent barriers to education-to-work transition, with Uttar Pradesh (40%), Punjab (40%), and Bihar (38%) recording the highest shares of young women not in education, employment, or training. These findings signal persistent deficits in access to education, female secondary school completion rates, and school-to-work transitions that limit progress in human development and women's empowerment.

In this discourse, education remains one of the most effective levers for advancing women's empowerment, enabling informed choices, expanding agency, and opening pathways to participation in the economy and public

life. Yet, for many adolescent girls in India, access to and completion of education remains a persistent challenge. A key barrier to girls' continued education is the persistence of regressive social norms that devalue girls' education, restrict their mobility, and prioritise early marriage. These socio-cultural expectations, combined with structural barriers, directly undermine retention and completion of secondary schooling. Secondary data suggests that the dropout rates climb steeply from 1.7% in primary to 12.6% at the secondary level [173], with girls from rural and marginalised communities most at risk. Also, 23 million girls are estimated to drop out of school annually due to inadequate menstrual hygiene management [174], stemming from the lack of sanitary products and the absence of sanitation facilities. These numbers reflect the deeper weight of social norms, household responsibilities, and poor infrastructure that continue to shape girls' futures. Essential steps (both policy and programmatic) recommended to address the barriers are: (a) Amend the Right to Education Act to extend free and compulsory education up to 18 years of age; (b) Invest in targeted social behaviour change (SBC) campaigns that promote the value of girls' education and challenge gender-biased norms at the community level; and (c) Invest in removing practical barriers—such as poor sanitation, lack of menstrual hygiene support, unsafe school transport, and distance to schools—that disproportionately affect girls.

6. **Shift Social Norms through Innovative Social Behaviour Change (SBC) Strategies**

One key finding of the study is that states with high AHDI do not necessarily exhibit high levels of AWEI. In fact, no Indian state falls within the high AWEI category. This highlights the need to complement investments in education and employment with efforts to comprehensively address and transform deeply rooted patriarchal norms that continue to perpetuate gender inequalities across social, economic, and political spheres. Quantitative and qualitative findings confirm the strong influence of deep-rooted social and cultural norms on reproductive and family planning decisions. These norms continue to limit women's agency across public and private domains. In states with high levels of women's empowerment but moderate to high fertility, such as Chhattisgarh, Meghalaya, and Manipur, norms still largely shape reproductive choices and constrain autonomy. The effect is even more pronounced in states with both low empowerment and high fertility. At the same time,

the presence of female role models can positively influence aspirations and agency, particularly among adolescent girls and young women.

Promoting gender-equitable social norms requires coordinated action across stakeholders—Governments should implement gender-transformative policies and communication programmes; Donors must prioritise long-term investment in SBC, with a focus on norm change; Civil society organisations should lead on community engagement and programme delivery; and communities must act as change agents by internalising and modelling new norms. Sustained investment in innovative, evidence-based SBC initiatives to address regressive social norms and promote messages around gender equality, positive masculinity, male engagement, and women's empowerment. In this context, Population Foundation of India's flagship SBC initiatives, such as 'Main Kuch Bhi Kar Sakti Hoon – I, a Woman, Can Achieve Anything', illustrate the potential of transmedia in shifting social norms [175, 176]. Future initiatives should expand the use of digital platforms such as gender-sensitive AI chatbots and voice assistants, gender innovative labs, digital learning communities of practices, web series, interactive WhatsApp dramas such as Sanlam's initiative[xiv], the AI-Powered Interactive Audio Game Built for WhatsApp, etc., to reach a large young population in the country.

7. Strengthening Data Systems and Evidence-Based Evaluations for Advancing Women's Empowerment

A key observation highlighted in the study is the scarcity of standardised, longitudinal data on women's empowerment. To enable evidence-based policymaking and targeted interventions, it is imperative to develop and institutionalise periodic data collection mechanisms that capture the multidimensional aspects of women's empowerment [177]. Governments should embed similar indices into planning frameworks, track them annually with disaggregated data, and establish cross-state learning platforms. These mechanisms will ensure that progress in empowerment directly supports broader human development. In addition to strengthening data systems, women-centric schemes and programmes should be periodically evaluated by a third party to ensure effective implementation,

[xiv] ***For more information:*** *Sanlam launches its new social media drama, Lives of Grace [https://www.mediaupdate.co.za/social/144017/sanlam-launches-its-new-social-media-drama-lives-of-grace]*

facilitate course correction, and document key learnings for scalability and future programme development. A structured, independent review mechanism may enhance accountability, improve programmatic outcomes, and enable the replication of successful models in diverse socio-economic contexts.

8. **One Size Does Not Fit All: Tailor Policies and Programmes to State Realities**

Adopt a cluster-based, context-specific policy and programme approach tailored to the unique demographic, development, and gender profiles of each state and union territory, supported by an enabling national policy framework and targeted fiscal support. The analysis reveals significant sub-national disparities in human development (AHDI), women's empowerment (AWEI), and fertility rates (TFR), along with strong positive correlations between AHDI and AWEI and moderate negative correlations between AHDI and TFR and AWEI and TFR. These findings underline the need for tailored policy responses. Also, policy intent alone is not enough. Progress is often constrained by weak implementation, limited coordination across sectors, and inconsistent follow-through at the state and district levels. Translating national priorities into sustained, context-specific action remains the key challenge and opportunity for policy action.

States and union territories with high AHDI, high AWEI,

and low TFR, such as Goa, Kerala, Sikkim, Tamil Nadu, and Himachal Pradesh, need to prioritise maintaining the quality of SRH services and improving elderly care. In contrast, states with low AHDI, low AWEI, and high TFR such as Bihar, Uttar Pradesh, Jharkhand, and Rajasthan, require foundational investments in girls' education, delayed age at marriage, improved access to comprehensive sexuality education, reproductive health services, socio-cultural norm change initiatives to address barriers and encourage men to share responsibilities, particularly in caregiving and household roles, and strengthened health service delivery. Addressing these geographies requires integrated programming that combines investments in health, education, livelihoods, and gender equality. In states with low AHDI, high AWEI, and moderate to high TFR, such as Chhattisgarh, Meghalaya, and Manipur, investments should address socio-cultural barriers to reproductive health, expand service delivery, and strengthen locally grounded health systems. States with high AHDI, low AWEI, and moderate to low TFR, such as Andhra Pradesh, Gujarat, and Punjab, should focus on improving women's economic participation, representation in decision-making, and institutional accountability for gender equality.

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Annexures

Table A1: Adaptive Human Development Index: Detailed Definitions and Sources

Dimensions	Indicators	Description
Long and Healthy Life	Life Expectancy at Birth	The life expectancy at birth usually denoted by e00, measures the average number of years a person is expected to live under prevailing mortality conditions. **Source:** Sample Registration System (SRS) Abridged Life Tables, Registrar General of India **Year:** 2016-2020
	% of Malnourished Children Under 5 Years of Age [weight-for-age]	Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both acute and chronic undernutrition. Children whose weight-for-age Z-score is below minus two standard deviations (-2 SD) from the median of the reference population are classified as underweight. **Source:** National Family and Health Survey-5 **Year:** 2019-2021
	Maternal Mortality Ratio (MMR)	MMR is defined as the number of maternal deaths per 100,000 live births. A maternal death is the death of a woman during pregnancy, childbirth, or within 42 days of the termination of pregnancy. **Source:** Sample Registration System **Year:** 2018-2020
Knowledge	Expected Years of Schooling for Children	The total number of years of schooling which a child of a certain age can expect to receive in the future, assuming that the probability of his or her being enrolled in school at any particular age is equal to the current enrolment ratio for that age. For a child of a certain age, the indicator is calculated as the sum of the age specific enrolment rates for the levels of education specified and multiplied by the duration of that level of education. **Source:** Unified District Information System for Education + **Year:** 2023-2024
	Mean Years of Schooling for Adults of Age 25 Years and Older	Average number of completed years of education of a country's population aged 25 years and older, excluding years spent repeating individual grades. **Source:** Periodic Labour Force Survey **Year:** 2023-2024

Dimensions	Indicators	Description
Decent Standard of Living	Log of Per Capita Net State Domestic Product (NSDP)	State Domestic Product (SDP) is defined as a measure in monetary terms of the volume of all goods and services produced within the boundaries of the state during a given period of time. Per capita NSDP is the measure of the economic output of a state divided by its population. Because each dimension index is a proxy for capabilities in the corresponding dimension, the transformation function from income to capabilities is likely to be concave – that is, each additional rupee of income has a smaller effect on expanding capabilities. Thus, for income, the natural logarithm of the actual values is used. **Source:** National Accounts Statistics, CSO, MoSPI **Year:** 2022-2023

Table A2: Adaptive Human Development Index -Data Issues and Adjustments

Dimensions	Adjustments
Life Expectancy at Birth	Following adjustments were made (as also applied in Report on Gendering Human Development, MoSPI, 2017-18) • The provided value for Assam was applied to all the north-eastern states: Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. • The average of the values for the neighbouring states of Punjab and Haryana was applied to Chandigarh. • The value for Tamil Nadu was applied to Puducherry due to its proximity to the state. • All India average value was applied for the island union territories Andaman & Nicobar Island, Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep. • The average of the values for the neighbouring states of Maharashtra and Karnataka was applied to Goa.
Maternal Mortality Ratio	MMR is not available for 2018-20 for Jammu & Kashmir, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Chandigarh, Himachal Pradesh, Delhi, Puducherry, Goa, Andaman & Nicobar Islands, Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep. The following adjustments were made (as also applied in Report on Gendering Human Development, MoSPI, 2017-18): • The provided value for 'Other States' was applied to all the north-eastern states: Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, and also to Himachal Pradesh, Delhi and Goa. • The average of the values for the neighbouring states of Punjab and Haryana was applied to Chandigarh.

Dimensions	Adjustments
	• The value for Tamil Nadu was applied to Puducherry due to its proximity to the state. • All India average value was applied for the island union territories Andaman & Nicobar Island, Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep.
Log of Per Capita Net State Domestic Product (NSDP)	Data was unavailable for Dadra & Nagar Haveli, Daman & Diu, Lakshadweep, and Ladakh. • All India average value was applied for Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep. • The value for Jammu & Kashmir was applied to Ladakh.

Table A3: Adaptive Women Empowerment Index: Detailed Definitions and Sources

Dimensions	Indicators	Description
Life and Good Health	% of currently married women (15-49 years) using any modern family planning method	The proportion of married women's contraceptive use (of modern method). Modern methods include female sterilisation, male sterilisation, pill, IUD/PPIUD, injectables, male condom, female condom, emergency contraception, standard days method (SDM), diaphragm, foam/jelly, lactational amenorrhoea method (LAM), and others. **Source:** National Family and Health Survey-5 **Year:** 2019-2021
	Adolescent fertility rate (births per 1,000 women aged 15-19 years)	The average number of children a woman would have by the end of her childbearing years if she bore children at the current age-specific fertility rates. Age-specific fertility rate is calculated for the three years before the survey, based on detailed birth histories provided by women. **Source:** National Family and Health Survey-5 **Year:** 2019-2021
	% of women aged 15-24 years using a hygienic method during their menstrual period	Women who use locally prepared napkins, sanitary napkins, menstrual cups, or tampons during their menstrual period. **Source:** National Family and Health Survey-5 **Year:** 2019-2021

Dimensions	Indicators	Description
Education, Skill-Building and Knowledge	% of women (25 years and older) with completed secondary education or higher	**Source:** Periodic Labour Force Survey **Year:** 2023-2024
	% of female youth (15-24 years) not in education, employment or training	**Source:** Periodic Labour Force Survey **Year:** 2023-2024
Labour and Financial Inclusion	% of females (15-59 years) engaged in paid work (excluding unpaid helpers in family enterprises)	Percentage of female population that is part of labour force and getting paid for their work. Women working as unpaid household workers have been excluded from the calculation. **Source:** Periodic Labour Force Survey **Year:** 2023-2024
	% of women of (15-49 years) who have a bank or savings account that they themselves use	The indicator serves as a measurement of women's access to money and microcredit. **Source:** National Family and Health Survey-5 **Year:** 2019-2021
Participation in Decision-Making	% share of seats held in State Assemblies by women	**Source:** Women and Men in India, NSO, MoSPI **Year:** 2023
	% share of managerial positions held by women	**Source:** Women and Men in India, NSO, MoSPI **Year:** 2022
Freedom from Violence	% of ever-married women (18-49 years) who have experienced [often or sometimes] physical, or sexual violence committed by their husband in the last 12 months preceding the survey	**Source:** National Family and Health Survey-5 **Year:** 2019-2021

Table A4: Adaptive Women Empowerment Index: Data Issues and Adjustments

Dimensions	Adjustments
Percentage share of seats held in State Assemblies by women	The information does not exist for the union territories of Chandigarh, Ladakh, Puducherry, Andaman & Nicobar Islands, Lakshadweep, Dadra & Nagar Haveli, and Daman & Diu. Therefore, the following adjustments were made: • The average of the values for the neighbouring states of Punjab and Haryana was applied to Chandigarh. • The value for Tamil Nadu was applied to Puducherry due to its proximity to the state. • The value for Jammu & Kashmir was applied to Ladakh. • All India average value was applied for Dadra & Nagar Haveli, Daman & Diu, Lakshadweep, and Andaman & Nicobar Islands.

Table A5: Adaptive Indices: Goalposts Considered for Normalising Indicators

Table A5.1: Adaptive Human Development Index

Dimensions	Indicators	Minimum	Maximum	Type
Long and Healthy Life	Life expectancy at birth	65	85	Positive
	% of malnourished children under 5 years of age [weight-for-age] (Includes children who are below -2 standard deviations (SD) from the WHO Child Growth Standards population median)	5%	65%	Negative
	Maternal Mortality Ratio	10	250	Negative
Knowledge	Expected years of schooling for children	0	18	Positive
	Mean years of schooling for adults of age 25 years and older	0	15	Positive
Decent Standard of Living	Log of Per Capita Net State Domestic Product (NSDP), 2022-23	4.40	5.78	Positive

Reasoning

Since life expectancy is generally assumed to remain stable or increase over time, we have used a minimum threshold of 65 years. This figure is rounded off from lowest rural female figure (65.9) found in Uttar Pradesh as per SRS 2016-20.
Maximum life expectancy is set at 85, a realistic aspirational target for many countries over the last 30 years. Due to constantly improving living conditions and medical advances, life expectancy has already come very close to 85 years in several economies: 81 in Himachal Pradesh in India; 84.7 years in Hong Kong, China (Special Administrative Region) and 84.5 years in Japan (as adopted from HDR 2019 Technical Notes).

Countries like Japan, South Korea, and several Western European nations have achieved underweight rates below 5%, which is considered very low by global health standards. Therefore, we have used 5 as the minimum value for underweight (best case scenario). The district with the maximum percentage of underweight children in India is Pashchimi Singhbhum in Jharkhand, where 62% of children under 5 are underweight (weight-for-age), according to NFHS-5 data. We have rounded off the figure to 65.

As higher maternal mortality suggests poorer maternal health, for the maternal mortality ratio the maximum value is truncated at 1,000 deaths per 100,000 births and the minimum value at 10. The rationale is that countries where maternal mortality ratios exceed 1,000 do not differ in their inability to create conditions and support for maternal health and that countries with 10 or fewer deaths per 100,000 births are performing at essentially the same level and that small differences are random. Thus, minimum value of 10 is considered for MMR.

For Indian contextualisation, the highest MMR as per SRS MMR Bulletin (2017-19) was in Assam (205). Assuming higher values for rural areas, the maximum value is rounded off to 250.

Societies can subsist without formal education, justifying the education minimum of 0 years.
The maximum for expected years of schooling, 18, is equivalent to achieving a master's degree in most countries (as adopted from HDR 2019 Technical Notes).

Societies can subsist without formal education, justifying the education minimum of 0 years.
The maximum for mean years of schooling, 15, is the projected maximum of this indicator for 2025 (as adopted from HDR 2019 Technical Notes).

The high maximum value for Net State Domestic Product (NSDP) per capita was 2,95,113.5 (Goa) in 2022-23. Considering 6% annual growth rate, the indicator was estimated 12 years later and rounded off. Then, the natural log of that value is considered.
Similarly, minimum NSDP per capita of the states for the indicator was 29,909. We have considered a lower value 25,000. Then, the natural log of that value is considered.

Table A5.2: Adaptive Women's Empowerment Index

Dimensions	Indicators	Minimum	Maximum	Type
Life and Good Health	% of currently married women (15-49 years) using any modern family planning method	18%	100%	Positive
	Adolescent fertility rate (births per 1,000 women aged 15-19 years)	0	91	Negative
	% of women aged 15-24 years using a hygienic method during their menstrual period	50%	100%	Positive
Labour and Financial Inclusion	% of women (25 years and older) with completed secondary education or higher	10%	100%	Positive
	% of female youth (15-24 years) not in education, employment or training (NEET)	0%	85%	Negative
	% of females (15-59 years) engaged in paid work (excluding unpaid helpers in family enterprises)	10%	100%	Positive
	% of women of (15-49 years) who have a bank or savings account that they themselves use	50%	100%	Positive
Participation in Decision-Making	% Share of seats held in State Assemblies by women	0%	50%	Positive
	% Share of managerial positions held by women	0%	50%	Positive
Freedom from Violence	% of ever-married women (18-49 years) who have experienced [often or sometimes] physical, or sexual violence committed by their husband in the last 12 months	0%	60%	Negative

Reasoning

As per NFHS-5 data, Manipur reports the lowest percentage (18.2%) of currently married women using modern family planning methods. For standardisation, this minimum value is rounded off to 18. The aspirational target aligns with global SDG Target 5.6, which advocates universal access to sexual and reproductive health and rights. Thus, the maximum value is set at 100%, reflecting full coverage.

The highest value recorded among states was 90 (West Bengal) in NFHS-4 and 91 (Tripura) in NFHS-5; accordingly, the maximum value is set at 91.

Since the aspirational target is 0, the minimum value is set at 0.

The lowest percentage of women aged 15-24 years using a hygienic method during their menstrual period was recorded in Bihar in NFHS-5 (59.2%); therefore, the minimum value is taken as 50.

Since the ideal is for all women to have access to hygienic methods, the maximum value is set at 100.

The lowest value is seen for rural Scheduled Tribe (ST) women at the all-India level, the Mean Years of Schooling (MYS) is 12.3; therefore, the minimum value is set at 10. The National Education Policy, 2020 aims to ensure that all students have universal, free and compulsory access to high-quality and equitable schooling from early childhood care and education (age 3 years onwards) through higher secondary education (i.e., until Class 12). Hence the maximum is set at 100.

The minimum value is set at 0, aligning with the ideal scenario where all female youth are engaged in either education, employment, or training. The maximum value for the percentage of female youth (15-24 years) not in education, employment, or training (NEET) is set at 85, reflecting the highest observed levels.

The lowest value is observed in Lakshadweep (12.4%), and therefore the minimum value is rounded to 10. This indicator aligns with the global SDG Target 5.5, which seeks to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life. Accordingly, the ideal maximum value is set at 100.

The lowest value is observed in urban areas of Dadra & Nagar Haveli and Daman & Diu (51.9%) as per NFHS-5. Since having financial access is a key empowerment indicator, the ideal maximum value is set at 100.

The lowest observed value for the share of seats held by women in State Assemblies is 0%, which is taken as the minimum value. The long-term objective for this indicator is to achieve 50%, which reflects gender parity in political representation, and is therefore set as the maximum value.

The lowest observed value for the share of managerial positions held by women is 0%, which is taken as the minimum value. The long-term objective for this indicator is to achieve 50%, reflecting gender parity in leadership roles, and is therefore set as the maximum value.

The ideal value for the percentage of ever-married women aged 18-49 years who have experienced physical or sexual violence committed by their husband is 0%, which is taken as the minimum value. The maximum value is set at 60%, based on the highest observed levels reported.

Table A6: Adaptive Human Development Index: Indicators and Dimension Scores

Long and Healthy Life					
Major States	Life Expectancy at Birth	% of Malnourished Children Under 5 Years of Age [weight-for-age]	Maternal Mortality Ratio	Dimension Score: Long and Healthy Life	Expected Years of Schooling for Children
Delhi	75.8	21.8%	77.0	**0.66**	14.3
Goa	71.4	24.0%	77.0	**0.57**	15.0
Kerala	75.0	19.7%	19.0	**0.74**	13.2
Tamil Nadu	73.2	22.0%	54.0	**0.65**	13.4
Himachal Pradesh	73.5	25.5%	77.0	**0.60**	13.8
Maharashtra	72.9	36.1%	33.0	**0.59**	12.8
Telangana	70.0	31.8%	43.0	**0.56**	13.9
Uttarakhand	70.6	21.0%	103.0	**0.54**	13.9
Haryana	69.9	21.5%	110.0	**0.52**	12.0
Karnataka	69.8	32.9%	69.0	**0.51**	13.1
Punjab	72.5	16.9%	105.0	**0.59**	13.0
Gujarat	70.5	39.7%	57.0	**0.50**	10.1
Andhra Pradesh	70.6	29.6%	45.0	**0.57**	12.6
West Bengal	72.3	32.2%	103.0	**0.51**	12.9
Odisha	70.3	29.7%	119.0	**0.47**	11.4
Rajasthan	69.4	27.6%	113.0	**0.47**	11.5
Chhattisgarh	65.1	31.3%	137.0	**0.35**	10.5
Jharkhand	69.6	39.4%	56.0	**0.49**	9.9

Knowledge		Decent Standard of Living		Composite score
Mean Years of Schooling for Adults of Age 25 Years and Older	Dimension Score: Knowledge	Log of Per Capita Net State Domestic Product, 2022-23	Dimension Score: Decent Standard of Living	Adaptive HDI
8.9	**0.70**	5.4	**0.74**	**0.70**
9.5	**0.73**	5.5	**0.78**	**0.69**
9.9	**0.70**	5.2	**0.57**	**0.66**
8.0	**0.64**	5.2	**0.60**	**0.63**
8.6	**0.67**	5.2	**0.57**	**0.61**
8.3	**0.63**	5.2	**0.57**	**0.60**
7.1	**0.62**	5.2	**0.60**	**0.59**
8.0	**0.65**	5.2	**0.56**	**0.58**
8.4	**0.61**	5.2	**0.61**	**0.58**
7.4	**0.61**	5.2	**0.61**	**0.58**
7.5	**0.61**	5.1	**0.50**	**0.57**
7.2	**0.52**	5.3	**0.62**	**0.55**
5.8	**0.54**	5.1	**0.51**	**0.54**
6.5	**0.58**	4.9	**0.34**	**0.47**
6.2	**0.52**	5.0	**0.40**	**0.46**
6.0	**0.52**	4.9	**0.38**	**0.45**
6.3	**0.50**	4.9	**0.40**	**0.41**
5.7	**0.47**	4.8	**0.28**	**0.40**

Long and Healthy Life					
Major States	Life Expectancy at Birth	% of Malnourished Children Under 5 Years of Age [weight-for-age]	Maternal Mortality Ratio	Dimension Score: Long and Healthy Life	Expected Years of Schooling for Children
Assam	67.9	32.8%	195.0	**0.30**	11.3
Madhya Pradesh	67.4	33.0%	173.0	**0.32**	9.8
Uttar Pradesh	66.0	32.1%	167.0	**0.31**	9.8
Bihar	69.5	41.0%	118.0	**0.39**	8.4
Sikkim	67.9	13.1%	77.0	**0.58**	11.4
Mizoram	67.9	12.7%	77.0	**0.58**	15.3
Arunachal Pradesh	67.9	15.4%	77.0	**0.56**	12.1
Tripura	67.9	25.6%	77.0	**0.51**	12.5
Meghalaya	67.9	26.6%	77.0	**0.50**	15.9
Manipur	67.9	13.3%	77.0	**0.58**	13.6
Nagaland	67.9	26.9%	77.0	**0.50**	9.6
Chandigarh	71.2	20.6%	120.0	**0.53**	15.6
Puducherry	74.3	15.3%	54.0	**0.70**	14.2
Andaman & Nicobar Islands	70.0	23.6%	97.0	**0.53**	11.6
Lakshadweep	70.0	25.8%	97.0	**0.51**	10.3
Jammu & Kashmir	74.3	21.0%	77.0	**0.64**	11.2
Dadra & Nagar Haveli and Daman & Diu	70.0	38.7%	97.0	**0.44**	12.3
Ladakh	74.3	20.4%	77.0	**0.64**	11.1

Knowledge		Decent Standard of Living		Composite score
Mean Years of Schooling for Adults of Age 25 Years and Older	Dimension Score: Knowledge	Log of Per Capita Net State Domestic Product, 2022-23	Dimension Score: Decent Standard of Living	Adaptive HDI
6.8	**0.54**	4.8	**0.32**	**0.37**
5.8	**0.47**	4.8	**0.29**	**0.35**
6.5	**0.49**	4.7	**0.20**	**0.32**
5.1	**0.40**	4.5	**0.06**	**0.21**
6.8	**0.54**	5.4	**0.75**	**0.62**
9.1	**0.73**	5.1	**0.54**	**0.61**
6.8	**0.56**	5.0	**0.45**	**0.52**
6.9	**0.58**	5.0	**0.41**	**0.49**
7.0	**0.68**	4.8	**0.32**	**0.48**
9.0	**0.68**	4.8	**0.28**	**0.48**
9.2	**0.57**	4.9	**0.35**	**0.47**
11.4	**0.81**	5.4	**0.72**	**0.68**
9.4	**0.71**	5.1	**0.54**	**0.64**
8.6	**0.61**	5.2	**0.61**	**0.58**
9.7	**0.61**	5.0	**0.44**	**0.52**
7.6	**0.56**	4.9	**0.34**	**0.50**
8.5	**0.62**	5.0	**0.44**	**0.49**
7.2	**0.55**	4.9	**0.34**	**0.49**

Table A7: Adaptive Women's Empowerment Index: Indicators and Dimension Scores (Part A)

	Life and Good Health			
Major States	Modern Family Planning Method	Adolescent Birth Rate (births per 1,000 women aged 15-19 years)	Women Aged 15-24 Using a Hygienic Method During their Menstrual Period	Dimension Score: Life and Good Health
Goa	60.1%	14	96.8%	**0.77**
Kerala	52.8%	18	93.3%	**0.70**
Tamil Nadu	65.5%	34	98.4%	**0.72**
Himachal Pradesh	63.4%	22	92.0%	**0.72**
NCT of Delhi	57.7%	19	97.1%	**0.74**
Chhattisgarh	61.7%	24	69.0%	**0.55**
Punjab	50.5%	21	93.3%	**0.68**
Andhra Pradesh	70.8%	67	85.2%	**0.54**
Telangana	66.7%	48	93.4%	**0.64**
Haryana	60.5%	27	93.5%	**0.70**
Uttarakhand	57.8%	19	91.5%	**0.70**
Odisha	48.8%	40	81.7%	**0.52**
Maharashtra	63.8%	47	85.3%	**0.58**
Gujarat	53.6%	34	66.9%	**0.47**
Karnataka	68.2%	40	84.6%	**0.62**
Rajasthan	62.1%	31	84.3%	**0.63**
West Bengal	60.7%	81	83.4%	**0.43**

Education, Skill-Building & Knowledge			Labour and Financial Inclusion		
Women (25 years and older) with Completed Secondary Education or Higher	Female Youth (15-24 years) Not in Education, Employment or Training (NEET)	Dimension Score: Education, Skill-Building & Knowledge	Females (15-59 years) Engaged in Paid Work (excluding unpaid helpers in family enterprises)	Women Aged 15-49 Who have a Bank or Savings Account that they Themselves Use	Dimension Score: Labour and Financial Inclusion
45.4%	13.2%	**0.62**	24.4%	88.3%	**0.46**
49.5%	27.2%	**0.56**	36.0%	78.5%	**0.43**
35.3%	30.3%	**0.46**	39.0%	92.2%	**0.58**
42.2%	17.7%	**0.57**	42.8%	83.1%	**0.51**
43.2%	30.0%	**0.51**	19.3%	72.5%	**0.28**
21.4%	23.3%	**0.43**	23.6%	80.3%	**0.38**
41.1%	38.9%	**0.44**	28.7%	81.6%	**0.42**
23.6%	35.9%	**0.36**	34.1%	81.8%	**0.45**
32.9%	28.1%	**0.46**	34.0%	84.4%	**0.48**
40.2%	34.0%	**0.47**	21.4%	73.6%	**0.30**
37.5%	27.3%	**0.49**	25.3%	80.2%	**0.39**
19.7%	36.8%	**0.34**	28.2%	86.5%	**0.47**
37.2%	30.6%	**0.47**	29.8%	72.8%	**0.34**
25.5%	32.6%	**0.39**	33.9%	70.0%	**0.33**
33.9%	31.0%	**0.45**	29.2%	88.7%	**0.49**
19.4%	31.7%	**0.37**	24.3%	79.6%	**0.38**
23.0%	36.1%	**0.36**	33.5%	76.5%	**0.40**

Life and Good Health

Major States	Modern Family Planning Method	Adolescent Birth Rate (births per 1,000 women aged 15-19 years)	Women Aged 15-24 Using a Hygienic Method During their Menstrual Period	Dimension Score: Life and Good Health
Madhya Pradesh	65.5%	37	60.9%	**0.46**
Jharkhand	49.5%	64	75.1%	**0.39**
Uttar Pradesh	44.5%	22	72.9%	**0.51**
Assam	45.3%	61	67.0%	**0.33**
Bihar	44.4%	77	59.2%	**0.22**
NER (Excluding Assam)				
Mizoram	30.8%	22	91.0%	**0.58**
Sikkim	54.9%	22	86.3%	**0.64**
Arunachal Pradesh	47.1%	38	92.0%	**0.59**
Manipur	18.2%	43	83.4%	**0.40**
Meghalaya	22.5%	49	65.3%	**0.27**
Nagaland	45.3%	19	80.6%	**0.58**
Tripura	49.1%	91	69.1%	**0.25**
Chandigarh	55.6%	9	94.5%	**0.75**
Puducherry	62.1%	25	99.1%	**0.75**
Andaman &Nicobar Islands	57.7%	22	98.8%	**0.74**
Lakshadweep	30.1%	2	98.3%	**0.70**
Dadra & Nagar Haveli and Daman & Diu	59.8%	40	94.3%	**0.65**

Education, Skill-Building & Knowledge			Labour and Financial Inclusion		
Women (25 years and older) with Completed Secondary Education or Higher	Female Youth (15-24 years) Not in Education, Employment or Training (NEET)	Dimension Score: Education, Skill-Building & Knowledge	Females (15-59 years) Engaged in Paid Work (excluding unpaid helpers in family enterprises)	Women Aged 15-49 Who have a Bank or Savings Account that they Themselves Use	Dimension Score: Labour and Financial Inclusion
17.6%	34.9%	**0.34**	24.8%	74.7%	**0.33**
22.4%	29.4%	**0.40**	22.7%	79.6%	**0.37**
26.2%	40.3%	**0.35**	19.0%	75.4%	**0.30**
20.6%	32.4%	**0.37**	36.6%	78.5%	**0.43**
17.7%	38.4%	**0.32**	17.7%	76.7%	**0.31**
27.9%	5.7%	**0.57**	31.6%	80.7%	**0.43**
24.6%	10.2%	**0.52**	42.1%	76.4%	**0.44**
21.0%	15.0%	**0.47**	43.1%	78.2%	**0.47**
38.4%	12.8%	**0.58**	38.1%	74.0%	**0.40**
25.4%	15.8%	**0.49**	58.7%	70.4%	**0.47**
36.2%	22.9%	**0.51**	47.5%	63.7%	**0.35**
17.2%	36.0%	**0.33**	35.5%	76.9%	**0.41**
67.0%	19.6%	**0.70**	29.5%	87.1%	**0.48**
42.9%	26.2%	**0.53**	34.4%	92.6%	**0.56**
38.0%	30.8%	**0.47**	25.2%	89.2%	**0.48**
49.2%	53.8%	**0.40**	12.4%	66.9%	**0.18**
38.7%	29.9%	**0.48**	32.5%	83.6%	**0.46**

Life and Good Health				
Major States	Modern Family Planning Method	Adolescent Birth Rate (births per 1,000 women aged 15-19 years)	Women Aged 15-24 Using a Hygienic Method During their Menstrual Period	Dimension Score: Life and Good Health
Jammu & Kashmir	52.5%	9	74.5%	**0.60**
Ladakh	48.0%	2	79.1%	**0.64**

Table A8: Adaptive Women's Empowerment Index: Indicators and Dimension Scores (Part B)

Participation in Decision-Making			
Major States	Share of Seats held in State Assemblies by Women	Share of Managerial Positions held by Women	Dimension Score: Participation in Decision-Making
Goa	7.5%	21.9%	**0.29**
Kerala	7.9%	21.7%	**0.30**
Tamil Nadu	5.1%	22.0%	**0.27**
Himachal Pradesh	1.5%	12.6%	**0.14**
NCT of Delhi	11.4%	19.1%	**0.31**
Chhattisgarh	21.1%	12.7%	**0.34**
Punjab	11.1%	7.5%	**0.19**
Andhra Pradesh	8.0%	30.4%	**0.38**
Telangana	8.4%	17.5%	**0.26**

Education, Skill-Building & Knowledge			Labour and Financial Inclusion		
Women (25 years and older) with Completed Secondary Education or Higher	Female Youth (15-24 years) Not in Education, Employment or Training (NEET)	Dimension Score: Education, Skill-Building & Knowledge	Females (15-59 years) Engaged in Paid Work (excluding unpaid helpers in family enterprises)	Women Aged 15-49 Who have a Bank or Savings Account that they Themselves Use	Dimension Score: Labour and Financial Inclusion
30.5%	19.6%	**0.50**	36.3%	84.9%	**0.49**
26.2%	17.6%	**0.49**	42.5%	88.4%	**0.56**

Freedom from Violence		Composite Score
Ever-Married Women (18-49 years) who Experienced [often or sometimes] Physical or Sexual Violence Committed by their Husband in Last 12 Months	Dimension Score: Freedom from Violence	Adaptive Women Empowerment Index (AWEI)
5.5%	**0.91**	**0.57**
6.8%	**0.89**	**0.54**
29.0%	**0.52**	**0.49**
6.3%	**0.89**	**0.48**
15.8%	**0.74**	**0.47**
17.4%	**0.71**	**0.46**
9.1%	**0.85**	**0.46**
25.5%	**0.58**	**0.46**
28.8%	**0.52**	**0.45**

Participation in Decision-Making			
Major States	Share of Seats held in State Assemblies by Women	Share of Managerial Positions held by Women	Dimension Score: Participation in Decision-Making
Haryana	10.0%	11.9%	**0.22**
Uttarakhand	11.4%	3.3%	**0.15**
Odisha	8.9%	19.5%	**0.28**
Maharashtra	8.3%	15.7%	**0.24**
Gujarat	8.2%	18.8%	**0.27**
Karnataka	4.5%	26.2%	**0.31**
Rajasthan	10.1%	10.1%	**0.20**
West Bengal	13.7%	14.4%	**0.28**
Madhya Pradesh	11.7%	18.9%	**0.31**
Jharkhand	12.3%	14.2%	**0.27**
Uttar Pradesh	11.7%	9.8%	**0.21**
Assam	4.8%	13.8%	**0.19**
Bihar	10.7%	7.3%	**0.18**
NER (Excluding Assam)			
Mizoram	7.5%	40.8%	**0.48**
Sikkim	9.4%	32.5%	**0.42**
Arunachal Pradesh	5.0%	22.9%	**0.28**
Manipur	8.3%	29.0%	**0.37**
Meghalaya	5.0%	31.0%	**0.36**
Nagaland	3.3%	8.3%	**0.12**
Tripura	15.0%	16.1%	**0.31**

Freedom from Violence		Composite Score
Ever-Married Women (18-49 years) who Experienced [often or sometimes] Physical or Sexual Violence Committed by their Husband in Last 12 Months	Dimension Score: Freedom from Violence	Adaptive Women Empowerment Index (AWEI)
13.0%	**0.78**	**0.44**
10.3%	**0.83**	**0.44**
21.6%	**0.64**	**0.43**
20.6%	**0.66**	**0.43**
11.2%	**0.81**	**0.42**
41.1%	**0.31**	**0.42**
16.2%	**0.73**	**0.42**
20.3%	**0.66**	**0.41**
23.5%	**0.61**	**0.39**
28.7%	**0.52**	**0.38**
28.7%	**0.52**	**0.36**
26.0%	**0.57**	**0.35**
34.9%	**0.42**	**0.28**
7.2%	**0.88**	**0.57**
8.4%	**0.86**	**0.56**
19.5%	**0.68**	**0.48**
21.9%	**0.64**	**0.47**
12.9%	**0.79**	**0.45**
4.4%	**0.93**	**0.41**
10.8%	**0.82**	**0.39**

Participation in Decision-Making

Major States	Share of Seats held in State Assemblies by Women	Share of Managerial Positions held by Women	Dimension Score: Participation in Decision-Making
Chandigarh	10.6%	15.2%	**0.26**
Puducherry	3.3%	26.1%	**0.29**
Andaman & Nicobar Islands	9.2%	7.2%	**0.16**
Lakshadweep	9.2%	18.0%	**0.27**
Dadra & Nagar Haveli and Daman & Diu	9.2%	1.8%	**0.11**
Jammu & Kashmir	2.3%	4.5%	**0.07**
Ladakh	2.3%	4.5%	**0.07**

Freedom from Violence		Composite Score
Ever-Married Women (18-49 years) who Experienced [often or sometimes] Physical or Sexual Violence Committed by their Husband in Last 12 Months	Dimension Score: Freedom from Violence	Adaptive Women Empowerment Index (AWEI)
7.7%	**0.87**	**0.47**
0.5%	**0.99**	**0.42**
12.5%	**0.79**	**0.42**
8.2%	**0.86**	**0.39**
17.4%	**0.71**	**0.39**
4.4%	**0.93**	**0.41**
10.8%	**0.82**	**0.39**

Table A9: Results of GSEM Model

Variables	Coef.	exp(b)	P> |t|
Workforce Participation			
Fertility	0.1398045	1.150049	0
Women's Empowerment	-0.0439701	0.9569826	0
Wealth Index (base category - Poorest)			
Poorer	0.022529	1.022785	0.03
Middle	0.030194	1.030654	0.032
Richer	0.0000645	1.000065	0.997
Richest	-0.0110712	0.9889898	0.646
Religion (base category - Hindu)			
Muslim	-0.1538631	0.8573894	0
Christian	0.0112252	1.011288	0.624
Sikh	-0.0126974	0.9873829	0.593
Others	-0.0008766	0.9991238	0.977
Total Household Members	-0.0355622	0.9650627	0
Husband/Partner's Age	-0.0032563	0.996749	0
Social Group (base category - Scheduled Caste)			
Scheduled tribe	0.0546896	1.056213	0
OBC	-0.0093645	0.9906792	0.28
None of them	-0.0254412	0.9748797	0.021
Don't know	-0.0307447	0.9697231	0.33

Variables	Coef.	exp(b)	P> |t|
Highest Education Attainment of Woman (base category - No Education)			
Primary	0.0218381	1.022078	0.083
Secondary	0.0371665	1.037866	0.012
Higher	0.1481621	1.159701	0
State			
Himachal Pradesh	-0.0389494	0.9617994	0.211
Punjab	-0.0779343	0.9250252	0.011
Chandigarh	-0.0300367	0.97041	0.686
Uttarakhand	-0.1367639	0.8721761	0
Haryana	-0.1363172	0.8725658	0
NCT of Delhi	-0.1215872	0.8855138	0
Rajasthan	-0.1177501	0.8889182	0
Uttar Pradesh	-0.2298488	0.7946538	0
Bihar	-0.2762964	0.7585881	0
Sikkim	0.0218777	1.022119	0.648
Arunachal Pradesh	-0.1068842	0.8986298	0.002
Nagaland	-0.1129172	0.8932247	0.006
Manipur	0.0792201	1.082443	0.062
Mizoram	-0.1913813	0.8258177	0
Tripura	-0.0792877	0.9237741	0.048
Meghalaya	-0.0513498	0.9499463	0.243
Assam	-0.0926038	0.9115546	0.002
West Bengal	-0.0936607	0.9105917	0.001
Jharkhand	-0.1637612	0.8489448	0
Odisha	-0.1479011	0.8625164	0

Variables	Coef.	exp(b)	P> |t|
Chhattisgarh	-0.0370159	0.9636608	0.206
Madhya Pradesh	-0.084817	0.9186804	0.001
Gujarat	0.015329	1.015447	0.571
Dadra & Nagar Haveli And Daman & Diu	-0.0771069	0.9257909	0.104
Maharashtra	0.0826047	1.086112	0.003
Andhra Pradesh	0.0250752	1.025392	0.406
Karnataka	0.0519506	1.053324	0.091
Goa	0.0179702	1.018133	0.673
Lakshadweep	-0.0530727	0.9483111	0.369
Kerala	0.0065507	1.006572	0.833
Tamil Nadu	0.0440576	1.045043	0.118
Puducherry	0.037133	1.037831	0.721
Andaman & Nicobar Islands	-0.0303059	0.9701487	0.552
Telangana	0.0539281	1.055409	0.059
Ladakh	-0.0172546	0.9828934	0.87
Husband/Partner's Education Level (base category - No Education)			
Primary	-0.0159367	0.9841896	0.139
Secondary	-0.0201751	0.980027	0.047
Higher	-0.0146161	0.9854902	0.303
Don't know	-0.0635493	0.9384278	0.161
Place of Residence (base category - Urban)			
Rural	0.0142325	1.014334	0.113
Age of Woman	-0.0002205	0.9997795	0.886
Constant	0.3239277	1.382547	0

Variables	Coef.	exp(b)	P> |t|
Fertility			
Workforce Participation	-0.6746552	0.509332	0
Women's Empowerment	-0.2673287	0.7654215	0
Wealth Index (base category - Poorest)			
Poorer	-0.2106838	0.8100302	0
Middle	-0.3637634	0.6950556	0
Richer	-0.525748	0.591113	0
Richest	-0.7262177	0.4837352	0
Religion (base category - Hindu)			
Muslim	0.2841312	1.328607	0
Christian	0.1609971	1.174682	0
Sikh	-0.1651408	0.8477744	0.002
Others	-0.1097984	0.8960147	0.109
Total Household Members	0.19864	1.219743	0
Husband/Partner's Age	0.008232	1.008266	0
Current Usage of Modern Contraceptive Method	0.4970087	1.643797	0
Social Group (base category - Scheduled Caste)			
Scheduled tribe	-0.0512782	0.9500143	0.069
OBC	-0.0964096	0.908092	0
None of them	-0.1796578	0.8355561	0
Don't know	-0.0653046	0.9367821	0.467

Variables	Coef.	exp(b)	P> |t|
Highest Education Attainment of woman (base category- no education)			
Primary	-0.1112366	0.894727	0
Secondary	-0.3497703	0.70485	0
Higher	-0.5151873	0.5973887	0
State			
Himachal Pradesh	0.2854173	1.330317	0
Punjab	0.3950473	1.484454	0
Chandigarh	0.7338877	2.083164	0
Uttarakhand	0.5702699	1.768744	0
Haryana	0.3934913	1.482146	0
NCT Of Delhi	0.4388065	1.550855	0
Rajasthan	0.2330424	1.262435	0
Uttar Pradesh	0.5107992	1.666623	0
Bihar	0.6435283	1.903184	0
Sikkim	-0.0170644	0.9830803	0.901
Arunachal Pradesh	0.36757	1.444221	0
Nagaland	0.6152635	1.850144	0
Manipur	0.5399329	1.715892	0
Mizoram	0.6357736	1.888483	0
Tripura	-0.0251243	0.9751887	0.739
Meghalaya	1.15638	3.178407	0
Assam	-0.0953499	0.9090548	0.075
West Bengal	-0.2240904	0.7992429	0
Jharkhand	0.3914	1.47905	0
Odisha	0.0114971	1.011563	0.822
Chhattisgarh	0.3685031	1.445569	0

Variables	Coef.	exp(b)	P> |t|
Madhya Pradesh	0.2630908	1.300945	0
Gujarat	0.3523566	1.422416	0
Dadra & Nagar Haveli And Daman & Diu	0.4949511	1.640418	0
Maharashtra	0.2042702	1.226629	0
Andhra Pradesh	0.0578546	1.059561	0.306
Karnataka	-0.1213318	0.88574	0.037
Goa	-0.1828643	0.8328812	0.094
Lakshadweep	-0.0117284	0.9883401	0.931
Kerala	0.0168765	1.01702	0.749
Tamil Nadu	0.1469089	1.158248	0.005
Puducherry	0.2625193	1.300202	0.163
Andaman & Nicobar Islands	0.268081	1.307453	0.015
Telangana	0.1581293	1.171318	0.003
Ladakh	-0.1839643	0.8319655	0.071
Husband/Partner's Education Level (base category - No Education)			
Primary	-0.0571874	0.944417	0.061
Secondary	-0.1412756	0.8682499	0
Higher	-0.2215984	0.8012371	0
Don't know	-0.0940543	0.9102333	0.475
Place of Residence (base category - Urban)			
Rural	-0.0697199	0.932655	0.001
Age of Woman	0.0760368	1.079002	0
Constant	-1.043708	0.3521466	0

Variables	Coef.	exp(b)	P> |t|
Women's Empowerment			
Workforce Participation	1.030579	2.802689	0
Fertility	0.4660956	1.593759	0
Wealth Index (base category - Poorest)			
Poorer	0.1741626	1.190249	0
Middle	0.4190751	1.520555	0
Richer	0.5809461	1.787729	0
Richest	0.8403754	2.317237	0
Religion (base category - Hindu)			
Muslim	-0.1568662	0.8548184	0.003
Christian	0.0030913	1.003096	0.973
Sikh	0.1520904	1.164266	0.04
Others	0.0453304	1.046374	0.643
Total Household Members	-0.1372765	0.8717292	0
Husband/Partner's Age	-0.0034935	0.9965126	0.219
Social Group (base category - Scheduled Caste)			
Scheduled tribe	0.0447229	1.045738	0.321
OBC	0.0905187	1.094742	0.003
None of them	0.1915839	1.211166	0
Don't know	-0.1381281	0.8709871	0.349
Highest Education Attainment of Woman (base category - No Education)			
Primary	0.3846484	1.469098	0
Secondary	0.5642216	1.758079	0
Higher	0.8971523	2.452609	0

Variables	Coef.	exp(b)	P> |t|
State			
Himachal Pradesh	0.5412862	1.718215	0
Punjab	0.2716089	1.312074	0.023
Chandigarh	0.5378694	1.712355	0.003
Uttarakhand	0.2217748	1.24829	0.093
Haryana	0.073464	1.07623	0.534
NCT of Delhi	-0.0358983	0.9647384	0.781
Rajasthan	0.1360265	1.145712	0.219
Uttar Pradesh	0.0021564	1.002159	0.984
Bihar	-0.0273437	0.9730268	0.818
Sikkim	0.6206407	1.86012	0.026
Arunachal Pradesh	0.0872535	1.091173	0.53
Nagaland	0.710024	2.03404	0
Manipur	-0.1289739	0.8789969	0.363
Mizoram	0.6003274	1.822716	0
Tripura	0.7008241	2.015413	0
Meghalaya	0.0811147	1.084495	0.585
Assam	0.530142	1.699173	0
West Bengal	0.5047518	1.656574	0
Jharkhand	0.3418423	1.407538	0.004
Odisha	0.2620376	1.299575	0.022
Chhattisgarh	0.4604258	1.584749	0
Madhya Pradesh	-0.0309726	0.9695021	0.778
Gujarat	0.3408503	1.406143	0.002
Dadra & Nagar Haveli And Daman & Diu	0.2554582	1.291053	0.062

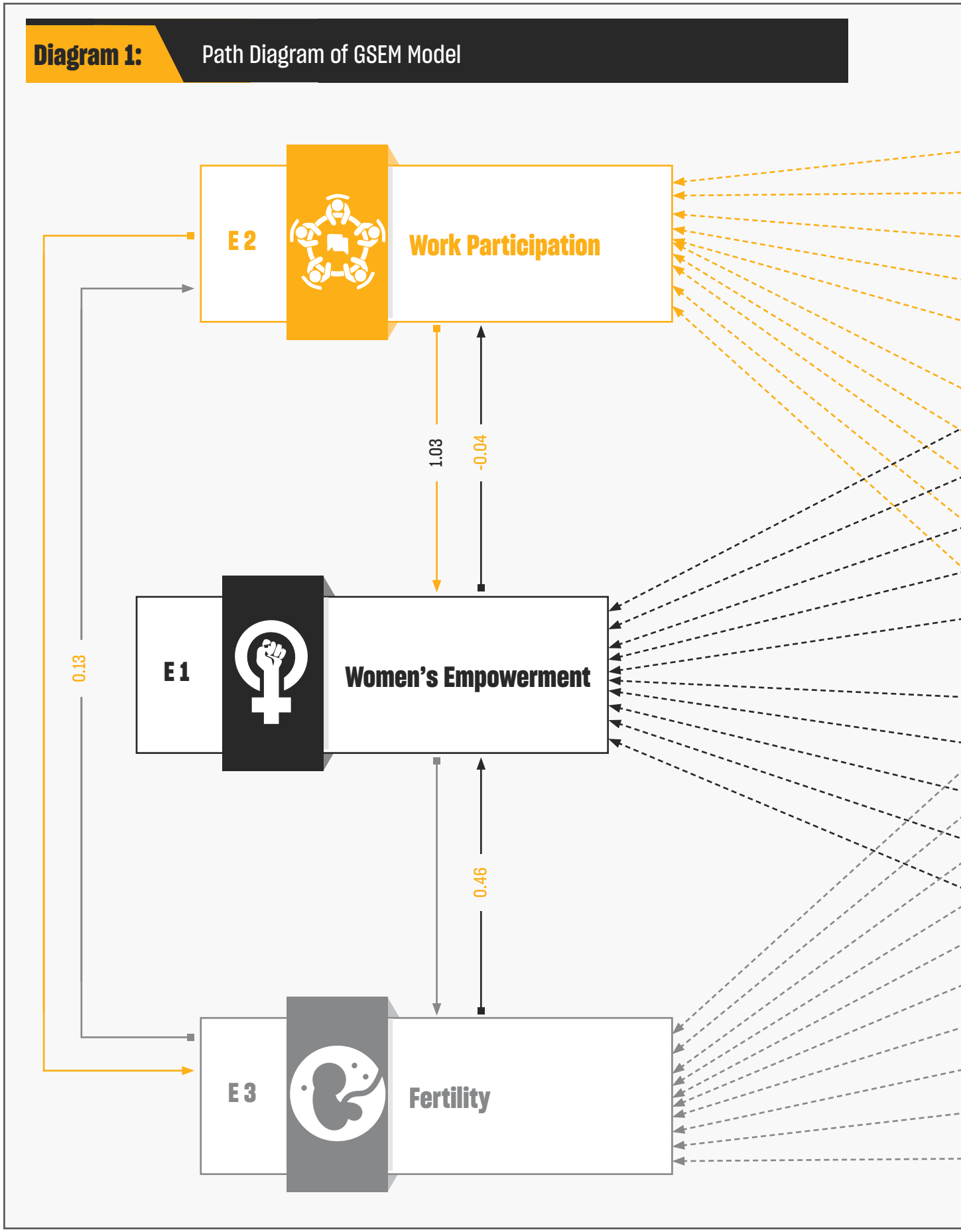
Variables	Coef.	exp(b)	P> |t|
Maharashtra	-0.0351098	0.9654994	0.752
Andhra Pradesh	-0.3568582	0.6998718	0.003
Karnataka	-0.5146403	0.5977155	0
Goa	0.1596827	1.173139	0.495
Lakshadweep	0.6013949	1.824662	0.001
Kerala	0.1481002	1.159629	0.191
Tamil Nadu	-0.1729955	0.8411414	0.125
Puducherry	-0.1616879	0.8507066	0.262
Andaman & Nicobar Islands	0.6497679	1.915096	0
Telangana	-0.6100477	0.543325	0
Ladakh	-0.2460738	0.7818645	0.372
Husband/Partner's Education Level (base category - No Education)			
Primary	0.0769403	1.079978	0.058
Secondary	0.2021608	1.224045	0
Higher	0.3594997	1.432613	0
Don't know	0.1313193	1.140332	0.533
Place of Residence (base category - Urban)			
Rural	-0.0910988	0.9129276	0.004
Age of Woman	-0.0241457	0.9761434	0
Constant	-0.8302921	0.4359219	0
var(e.Workforce Participation)	0.2085262		
var(e.Fertility)	1.399988		
var(e.Women's Empowerment)	2.820417		

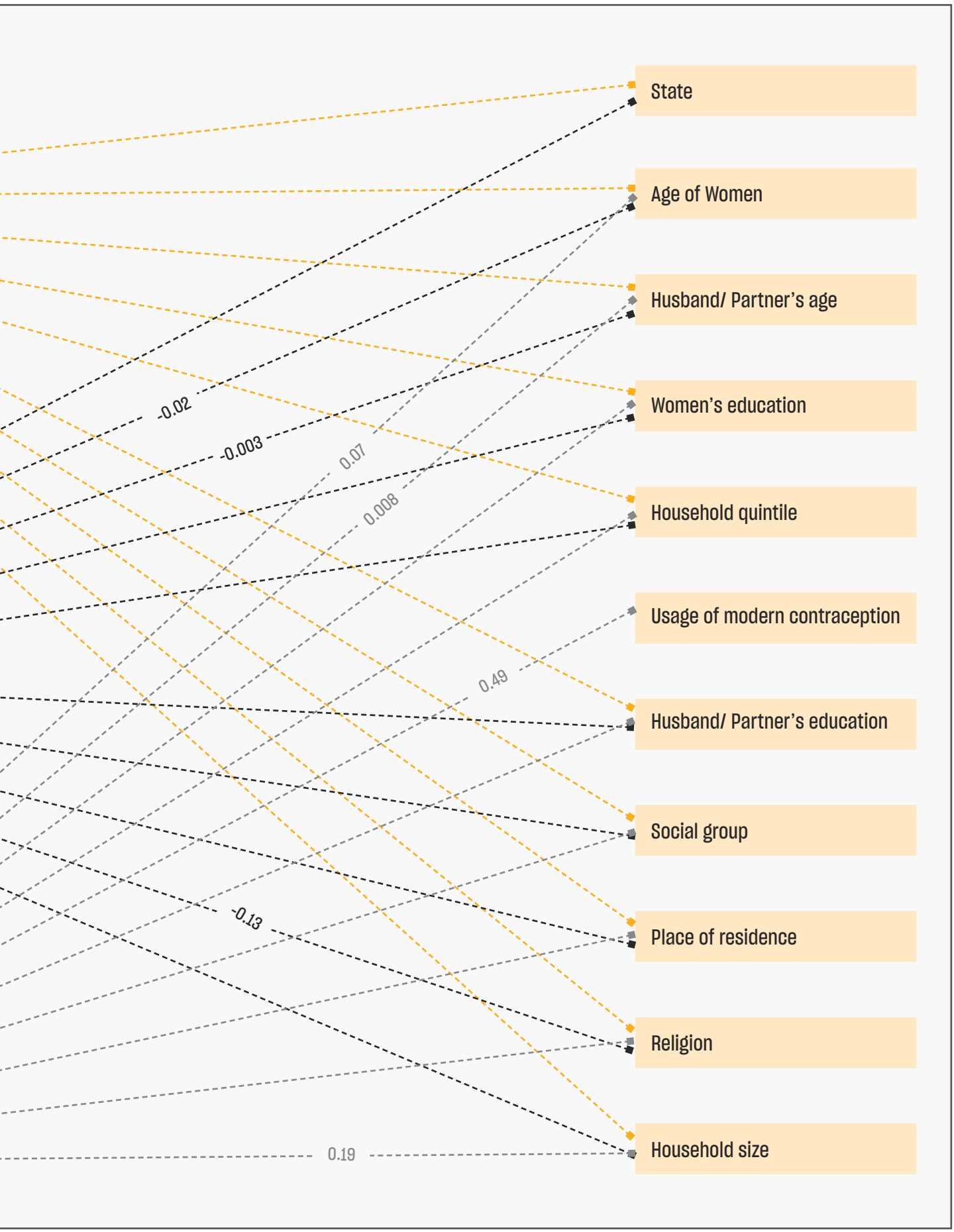
Table A10: Correlation Matrix of Variables used in GSEM Model

	Fertility	Workforce Participation	Women's Empowerment	Household Quintile based on Wealth Index	Religion	Total Household Members
Fertility	1					
Workforce Participation	0.083	1				
Women's Empowerment	-0.0319	0.0006	1			
Household Quintile based on Wealth Index	-0.2378	-0.0849	0.1398	1		
Religion	0.0306	0.0077	0.0503	0.0163	1	
Total Household Members	0.2674	-0.0653	-0.0571	0.01	-0.0237	1
Husband's/ Partner's Age	0.3739	0.1263	0.0501	0.0756	0.0087	-0.1734
Current Usage of Modern Contraceptive Method by Women	0.1969	0.0824	0.065	0.0697	-0.068	0.0192
Caste	-0.0774	-0.0784	0.0369	0.2481	-0.0693	0.0083
Highest Education Attainment of Woman	-0.4092	-0.0823	0.1649	0.4642	0.0224	-0.0185
State	-0.1124	0.1537	-0.0533	0.0215	-0.1474	-0.1458
Husband/ Partner's Education Level	-0.2805	-0.0904	0.1266	0.4055	-0.0121	0.007
Place of Residence	0.1075	0.0567	-0.0825	-0.4617	0.0081	0.0493
Age of Woman	0.4342	0.1438	0.0628	0.074	0.0295	-0.1533
Standard Deviation	1.51	0.45	1.60	1.39	0.90	2.43

	Husband's/ Partner's Age	Current Usage of Modern Contraceptive Method by Women	Caste	Highest Education Attainment of Woman	State	Husband's Education Level	Residence	Age of Woman
	1							
	0.1906	1						
	0.0392	0.017	1					
	-0.2228	-0.0638	0.148	1				
	0.0993	0.0907	-0.0421	0.0705	1			
	-0.1324	-0.0365	0.1359	0.5467	-0.02	1		
	-0.0584	-0.0146	-0.1118	-0.2361	-0.0782	-0.1793	1	
	0.8848	0.2062	0.0363	-0.2572	0.0254	-0.1433	-0.0515	1
	9.57	0.50	1.10	1.02	9.62	0.99	0.43	0.40

Diagram 1: Path Diagram of GSEM Model




State
Age of Women
Husband/ Partner's age
Women's education
Household quintile
Usage of modern contraception
Husband/ Partner's education
Social group
Place of residence
Religion
Household size
-0.02
-0.003
0.07
0.008
0.49
-0.13
0.19

Qualitative Tools (Vignettes) for In-Depth Interviews (IDIs)

A. Adolescent Girls (18 to 19 years)

Category 1: Adolescent Girl- Dropped Out of school

Vignette 1.1

Rekha, a 19-year-old, was once a bright and ambitious young girl who wanted to study and aspired to become an IPS officer. She was inspired by a lady Police officer posted in her district. However, due to financial constraints at home, Rekha had to drop out of school after class 10th at age 16. Her grades in school were better than her younger brother's, yet he continued his studies, unlike her.

The arrival of a marriage proposal from a distant relative shattered her dreams of ever continuing her education. Her father, swayed by the promise of financial security, saw it as a solution. She agreed to the marriage on the promise that her in-laws would support her in completing her education.

Questions/ Prompts for Respondents

a. Why do you think the parents treated Rekha and her brother differently in terms of investment in their education?

b. Apart from educational investment, have you observed aspects where girls are treated differently from boys?

c. What do you think happened after marriage?

d. What factors could have influenced her decision to agree to marriage?

e. Why do you think Rekha wanted to pursue higher education and become an IPS officer? How would education have helped her in future?

f. Are you aware of any government benefits (probe: scholarship) that could have helped Rekha to pursue her education?

Vignette 1.2

Rekha got married at the age of 19. Immediately after marriage, she became pregnant. She knew little about contraceptives or accessing any other family planning services. She was not able to discuss the same with her husband. Her first pregnancy ended in a stillbirth. Soon after, she conceived her second child. The pregnancies took a toll on her body, leaving her physically and mentally exhausted. Her doctor informed her that she was anaemic and should rest and take care of herself.

While her in-laws promised her parents before the wedding that they would support her in continuing her education, her days are now spent caring for the household and the child, without much support from the family.

Questions/ Prompts for Respondents

a. Do you think it is important for girls to have access to information about family planning before they get married? Why? Why not?

b. What health challenges do girls in your community face? How do these challenges affect their daily lives and future plans?

c. What would it be if you could change one thing for girls in your village?

d. Has someone you know faced a similar situation? If so, how did they handle it?

Scenario 1: Imagine if Rekha had had the opportunity to study and become a Police officer; what do you think her life situation would look like? [Probe: Access to Sexual & Reproductive Health information, adequate nutrition during pregnancy, and ability to negotiate – age of marriage, childbirth, etc.]

Scenario 2: Imagine Rekha had given birth to a girl child. Her in-laws and husband are still hoping for a boy. However, Rekha is exhausted and doesn't want another child so soon. What do you think she should do in such a situation? [Probe: Difficulties in managing infants; woman's health issues; son preference, caregiving burden; and her aspirations]

Vignette 1.3 (Common for all 3 categories of adolescent girls)

Shireen is an 18-year-old girl who has just completed her 12th standard. She has exceptional drawing skills and has dreamt of studying fashion design. She has decided to take a year off before joining college to focus on improving her skills and preparing for exams for fashion design colleges. She enrolled in a vocational training program to hone her tailoring skills. Shireen has supportive parents, and after seeing her put in effort for fashion design colleges,

they gift her an Android mobile phone so that she stays updated on the latest fashion trends and market needs.

She believes financial independence is important for women to make their own choices. In the future, she aspires to launch her boutique and fuse traditional Indian fabrics with modern designs while actively participating in online fashion communities.

Questions/ Prompts for Respondents

a. What skills do you think Shireen needs to fulfil her dreams? (Prompt – digital literacy, communication, marketing).

b. Do you think having a mobile phone/access to mobile internet helps, and in what ways?

c. What other skills do adolescent girls your age need for economic empowerment?

d. Do adolescent girls have avenues to access these skills in your area?

e. Despite supportive parents, do you feel Shireen will face social pressures to conform to traditional expectations for young girls during her year off before joining college?

Scenario 1: Soon, there were a few marriage proposals for Shireen. Relatives started suggesting to her parents that it is important to get her married, as the prospective grooms had good jobs, and she might not find such good matches easily in the future. She can always explore studying after marriage. Her parents are also considering this.

f. Why do you think Shireen's parents also considered getting her married off, even though they were earlier supportive of her decision to focus on studies?

g. Do you know of other adolescent girls in Shireen's situation? Do you think girls often face similar situations? Please explain.

h. How do you think Shireen should navigate the pressure of marriage and maintain her focus on her goals?

Scenario 2: Shireen came under societal pressure and has agreed to get married. However, there were many expectations from her as a daughter-in-law. She had to handle many responsibilities. Her dream to take admission at a reputed fashion college kept getting delayed. She became pregnant within a year of marriage. Plans for studies took a further backseat.

i. Why do you feel Shireen had to give in to societal pressure and get married?

j. How would such a situation impact Shireen's aspirations and goals?

k. Do you think Shireen could have delayed pregnancy? (Probe: Awareness and access to contraceptives, ability to make choices, husband's support, etc.)

Category 2: Adolescent Girl- Currently Studying

Vignette 2.1

Preeti is a 17-year-old girl studying in class 12. Her mother is a frontline health worker. Preeti is the youngest of the four siblings. Since childhood, she has heard about her mother's life ordeal of getting married at 15 years, followed by early pregnancies and other hardships. She had four children in quick succession because she had no knowledge about family planning methods and was unable to negotiate or make informed choices. Preeti sometimes accompanies her mother on home visits, which has made her aware of the health issues of young girls and women. Whenever she has free time, Preeti volunteers at the monthly local health camp, where her mother provides services. Preeti speaks to adolescent girls in such camps regarding menstrual hygiene, the importance of adequate nutrition and other sexual and reproductive health (SRH) issues.

Questions/ Prompts for Respondents

a. How does Preeti feel about her mother's experience of child marriage?

b. What impact does Preeti hope to make within her peer group by sharing the knowledge she gained from her mother?

c. What specific challenges could Preeti face when talking to girls about SRH issues? (probe: girls not opening up or hiding, cultural barriers/shame, contraception, safe sex, domestic violence and women's empowerment)

d. Do you think there are enough avenues for adolescent girls to access the information regarding SRH to make informed decisions? If yes, what are they? If not, what are the barriers?

Vignette 2.2

Inspired by her mother's work as a health worker, Preeti aspires to become a doctor and work towards improving health services in her community. Her experiences of meeting adolescent girls at the health camps and empowering them with essential knowledge fuelled her dream of becoming a doctor. She believes that educating adolescent girls regarding their health, nutrition, hygiene, etc., would empower them, unlike her mother's situation during her teenage years. Despite their financial struggles, Preeti's parents are determined to support their daughter to fulfil her dreams.

Questions/ Prompts for Respondents

a. How do you think support from parents enabled Preeti to make informed choices about her career decisions? (Probe: Awareness about government schemes that support higher education in general, and particularly for girls)

b. How has witnessing her mother's struggles shaped Preeti's own life goals?

c. What message do you draw from Preeti's story?

d. How do you think attainment of higher education and having one's own income contributes to a young woman's life choices and life ahead?

Scenario: Imagine Preeti's parents were not supportive and forced her to get married soon. What do you think Preeti's life would look like then? (Probe: Early marriage; early pregnancy; financial instability/dependency)

Vignette 2.3 (Common for all 3 categories of adolescent girls)

Category 3: Adolescent Girls- Married

Vignette 3.1

Sunita was married at the young age of 16 to a conservative family. She moved to a city with her husband after her marriage. The couple had heard about the importance of family planning and about various methods through radio and TV shows. Since they didn't want to start a family soon, they approached a nearby clinic to explore their family planning options. However, three years into marriage, the couple was under pressure to start a family.

Questions/ Prompts for Respondents

a. Do you think the couple found TV shows and radio programmes useful? How? (Probe: delaying pregnancy, spacing)

b. What would have enabled Sunita to delay her pregnancy? (Probe: Male engagement, support from family)

Vignette 3.2

Scenario 1: After a few years of marriage, Sunita conceived and gave birth to a girl child. The couple wanted to secure their child's future and save for her higher education. Considering this, they decided to opt for a LARC (Long-acting reversible contraception) method.

Questions/ Prompts for Respondents

a. Why do you think it was important for them to adopt LARC?

b. Why is investing in their child's education important?

c. Do you think their decision to adopt family planning methods has an overall impact on the well-being of the family? If yes, how? If not, why do you think so?

Scenario 2: Soon after the birth of a girl child, the couple was under pressure to have a son. Succumbing to the pressure, Sunita conceived within 6 months of her previous delivery. However, Sunita was always tired, exhausted and irritable while managing her second pregnancy and the six-month-old baby.

Questions/ Prompts for Respondents

a. What is the overall impact on Sunita's mental health?

b. Why do you think the couple gave in to the pressure of having a second child?

c. Do you think mother-in-law and sister-in-law share some of the household responsibilities, including childcare? Do you think her husband also shares some of the care work?

d. Do you know anybody who has faced a similar situation? Can you please elaborate?

e. Imagine Sunita has a friend who can balance her work and motherhood. How might that inspire Sunita? (Probe: Barriers Sunita may face, financial means, challenges women face in achieving work-life balance)

Vignette 3.3 (Common for all 3 categories of adolescent girls)

B. Young Women (20 to 29 years)

Category 4: Young Women– Unmarried and Working

Vignette 4.1

Kiran is 24 years old, completed her Masters in Sociology a year back and joined a newspaper as a junior reporter. She is in a serious relationship with Rahul, whom she has known since college. They have not told their families about their relationship as they want to focus on career building.

Since she got the job, her parents and relatives have started nudging her to get married. She got a promotion and was excited to tell her parents about it and about her relationship status. But before she could tell them, she found out that she was three months pregnant. She was not ready to have a child and discussed the same with Rahul. But Rahul was keen on having a child and argued that they should get married and settle down immediately.

Questions/ Prompts for Respondents

a. What do you think Kiran should do?

b. Why do you think it is important for Kiran to be financially independent and have a stable career before getting married?

c. What do you think are the factors that can influence Kiran's decisions?

d. Has someone you know faced a similar situation? If so, how did they handle it?

Vignette 4.2

Scenario 1: Kiran did not want to have a child at that time. She felt that she was not yet ready to take on the role of motherhood. Rahul was reluctant but eventually agreed on not having a child immediately so that they could focus on their career.

Questions/ Prompts for Respondents

a. What should Kiran do, in your opinion?

b. Do you think they faced any challenges in terminating the pregnancy? (Probe: contraception, abortion, people's judgment)

c. Do you think this incident took a toll on their life?

d. Do you know anyone who has faced such a situation? How did they handle it?

Scenario 2: Immediately after finding out that Kiran is pregnant, Rahul informs his parents, who want them to get married immediately. Although reluctant, Kiran yields to family pressure to get married and continue the pregnancy.

Questions/ prompts for respondents

a. How might this impact her career and overall well-being?

b. Why do you think Kiran finally agreed to go ahead with the pregnancy? (Probe: Decisions under societal pressure, cultural norms, judgments, etc)

c. Do you know anyone who has faced such a situation? How did they handle it?

Vignette 4.3 (Common for all 3 categories of young women)

Anjali is a 23-year-old confident woman who wants to make her career and make use of her higher education. However, her parents had begun to pressure her to marry. Subsequently, she agreed to marry Sunil after meeting multiple prospects, as he was supportive of her desire to work after marriage. Sunil was a bank employee and was staying with his parents and a younger sister.

Scenario 1: After marriage, Anjali was expected to take care of all household responsibilities. Sunil also expected Anjali to focus on household chores, and her career aspirations were hardly given any importance. Her in-laws wanted Anjali to plan a child soon, and her husband also took their side.

Questions/ Prompts for Respondents

a. Why do you think Sunil did not support Anjali to work immediately after marriage? (Probe: care-giving responsibilities, gender bias, in-laws' interference)

b. What do you think encourages Anjali to marry Sunil? (Probe: pretext of false promise to support Anjali to work after marriage)

c. Why do you think Anjali wanted to build her career after marriage? (Probe: financial independence, empowerment)

d. How do you think Anjali's overall well-being was affected under such circumstances?

Scenario 2: Sunil encouraged Anjali to pursue a career opportunity. Anjali's matrimonial family also supported her. Both Sunil and Anjali openly discussed family planning options and their savings plan.

Questions/ Prompts for Respondents

a. How delaying their first child could have empowered Anjali?

b. In what ways do you think Anjali's matrimonial family's support can influence her career growth?

c. What challenges might Anjali face in balancing her career and family planning, despite the support she has?

d. How can others learn from Anjali's experience to support the women in their households?

Category 5: Young Women– Married and Working

Vignette 5.1

Aayesha, a 27-year-old woman, got married around ten years ago and has two children. In the marriage, she has suffered multiple miscarriages, taking a toll on her physical and emotional health. All these years, she has often endured physical and emotional abuse at the hands of her husband.

She shared her concerns with one of her neighbours, who was a member of a self-help group (SHG) in the village. Initially reluctant to attend a meeting of the group, one day she decided to go along with her neighbour to attend the SHG meeting. She got inspired listening to SHG members about issues such as women's empowerment, agency, government schemes,

financial independence, sexual and reproductive health issues and domestic violence. Against her husband's will, she decided to join the SHG.

Questions/Prompts for Participants

a. Ayesha has endured physical and emotional abuse for years. Do you think she would have considered leaving the relationship? If not, why not?

b. Why do you think Aayesha decided to join the SHG despite the backlash? Why was it so important for her? [Probe: Financial independence, contribution of household income, mobility, family planning issues and methods]

c. How did Ayesha muster the courage to join the SHG despite her husband's opposition? What internal strength did she draw upon?

d. Have you heard of or come across other women facing similar experiences? How have they handled such a situation?

Vignette 5.2

Gradually, through micro-saving, she started contributing to her household income. Since she was aware of government schemes, she started accessing some of schemes and has been able to support her children's education. Slowly, her husband realized and reflected on his past behaviour and made efforts to support her. Aayesha inspired other girls in her family also to complete their education, develop new skills and become more independent.

Questions/Prompts for Participants

a. What has changed in Aayesha's life since she became a member of SHG?

b. Do you think Aayesha participates in the household's financial decisions? [Probe: agency; decision making, access to resource]

c. How has her self-confidence grown since joining the SHG? Does she feel a sense of agency and control over her life now?

d. Does Aayesha's story inspire you? If yes, then in what ways?

Scenario: Imagine a scenario in which Aayesha was not a member of the SHG group. How would her life look?

Vignette 5.3 (Common for all 3 categories of young women)

Category 6: Young Women– Married and Not Working

Vignette 6.1

Smriti, a 25-year-old woman, moved to another city with her husband after marriage. She was excited to start a new life in a new city. Her husband had also recently changed his job and was working hard to secure their future. Therefore, the couple decided to wait for at least 3 years before starting a family. The couple consulted a doctor and opted for an IUCD.

Questions/Prompts for Participants

a. Why do you think the couple delayed their first child? What are the benefits?

b. How has the move to a new city and the decision to delay starting a family empowered Smriti in building her own identity?

c. Do you think delaying the first child impacts the husband and wife's interpersonal relationship? Please elaborate.

Vignette 6.2

Scenario: Smriti began experiencing severe side effects from the IUCD. She was unable to manage her daily routine because of this, so they consulted a doctor and removed the IUCD. Smriti conceived within 4 months of this. The couple was scared to opt for abortion, fearing that they would not be able to have a child in future. They decided to continue with the pregnancy.

Questions/Prompts for Participants

a. Why do you think Smriti and her husband decided to remove the IUCD? (Probe: side-effects of IUCD)

b. Do you think Smriti's unwanted pregnancy impacted her overall well-being? How? (Probe: physical & mental well-being)

c. Do you think the couple was aware of other family planning methods? (Probe: post IUCD removal---other options)

d. What challenges will the couple face under this situation? (Probe: financial instability, emotionally draining)

e. Why do you think the couple was scared to opt for abortion? (Societal pressure, myths, misinformation)

Notes

Map Disclaimer

The map of India on the cover of the report has been drawn for illustrative and artistic purposes only. It may not accurately reflect the current official boundaries, names, or territories of Indian states or union territories. No part of this map is intended to infringe upon the legal, territorial, or political integrity of India as defined by the Government of India. If any inaccuracies exist, no offence or claim of authority is intended by this depiction. For any official use or reference, please consult maps issued by the Survey of India and other authorized agencies

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