International Journal of Arts Humanities and Social Sciences Studies
Volume 11 Issue 2 ǁ February 2026
ISSN: 2582-1601
www.ijahss.com

Reproductive Health and Population Dynamics among Tribal Women in ASR District A Sustainable Development Perspective

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Abstract: *Tribal women in India continue to face poor reproductive health outcomes due to persistent socio-economic disadvantages, cultural practices, and limited healthcare access. This study examines the relationship between reproductive health and population dynamics among tribal women in the Alluri Sitharama Raju (ASR) district of Andhra Pradesh, with reference to Sustainable Development Goals SDG 3 (Good Health and Well-Being) and SDG 5 (Gender Equality).Primary data were collected from 345 households in Chintapalli and Pedabayalu mandals using a mixed-methods approach. Married women aged 15–45 years with at least one living child in the age group of 1-10 years at the time of the survey were selected through stratified purposive sampling. Quantitative analysis was supported by qualitative insights. The findings reveal a high incidence of early marriage and adolescent pregnancy, with 39.1 per cent of women conceiving before 18 years. Fertility remains high (3.2–3.4 children per woman), and maternal mortality (204 per 100,000 live births) exceeds state and national levels. Contraceptive use is low (37.7%), dominated by sterilization and traditional methods. Most deliveries (76.8%) occur at home with untrained attendants. Limited healthcare access, low female literacy, strong traditional beliefs, and economic hardship further worsen reproductive health outcomes. The study concludes that inadequate reproductive healthcare contributes to high fertility and population pressure, undermining sustainable development. Strengthening culturally appropriate health services, improving female education, and expanding healthcare access are essential for achieving health equity and gender empowerment in tribal regions.*

Keywords: *Alluri Sitharama Raju (ASR) district, Population Dynamics, Reproductive health Indicators, Sustainable Development, Tribal women.*

I. INTRODUCTION

India has the largest concentration of tribal populations in the world, with tribals constituting 8.6% of the country's total population, amounting to 104.28 million people, according to the 2011 Census. The tribal population has seen significant growth, with a 23.66% increase between 2001 and 2011, compared to the general population's growth rate of 17.64%. Despite this growth, tribal communities in India continue to face severe marginalization and economic impoverishment, which contributes to their difficulty in accessing essential reproductive health services. This issue is further exacerbated by their specific cultural beliefs and practices, as well as the limited reach of government benefits aimed at improving their living standards. Reproductive health is a crucial aspect of women's overall well-being, directly influencing their quality of life, socio-economic status, and community development. In tribal communities, women have historically been central to many economic and social practices, and their roles are deeply intertwined with factors affecting reproductive health. Women's reproductive health during conception, birth, breastfeeding and child- rearing has put them at the center of reproductive health for the population [1] .India is committed to the 17 Sustainable Development Goals (SDGs) during the 2015 UN General Assembly Summit, with the aim of fostering inclusive growth across economic, social, and environmental dimensions. Specifically, SDG 3, which focuses on ensuring healthy lives and well-being for all at all ages, includes four targets related to maternal and reproductive health, emphasizing their central role in overall development.

Previous research consistently demonstrates that tribal populations in India experience poorer health outcomes, lower literacy levels, adverse economic conditions, and weaker health-seeking behavior compared to non-tribal groups[2][3]. Among tribal women, unintended pregnancies remain disproportionately high[4], primarily due to low utilization of safe and modern contraceptive methods[5]. This is driven by a combination of early marriage, frequent and closely spaced pregnancies, inadequate nutrition, and limited access to healthcare services, all of which contribute to elevated maternal and child mortality rates[6]. [7], characterized these overlapping vulnerabilities as "maternal depletion," marked by chronic anemia, malnutrition, and related health complications resulting from repeated pregnancies and prolonged breastfeeding. Institutional delivery rates are also the lowest among tribal women, constrained by barriers such as unfriendly behavior of healthcare providers, language difficulties, and mistrust of modern medical systems [6]. These factors collectively create

significant inequities in reproductive health access, limiting tribal women's ability to benefit from the targets outlined under Sustainable Development Goal 3 (SDG 3). Data from NFHS-5 (2019–21) further reveal that while India has achieved replacement-level fertility (TFR 2.1), Scheduled Tribes continue to exhibit a higher fertility rate of 2.5 compared to 1.8 among other population groups [8]. Despite a high unmet need for family planning, contraceptive use remains low due to fear of side effects, lack of awareness, cultural and religious beliefs, health concerns, and negative past experiences [9], [10],[11],[12]. These conditions result in early childbearing, short birth intervals, and poorly timed pregnancies, thereby increasing maternal and infant morbidity and mortality and impeding sustainable development in tribal communities [13].

In response to these challenges, the Government of India has introduced several initiatives over the past decades, including the National Rural Health Mission (NRHM), Janani Suraksha Yojana (JSY), Mission Indradhanush, Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), and Ayushman Bharat. These programs aim to improve healthcare access, promote institutional deliveries, enhance maternal health services, and expand family planning coverage among marginalized populations. While these initiatives have contributed to improvements in certain reproductive health indicators, tribal women continue to experience substantially poorer outcomes compared to the general population. This persistent gap highlights the need for culturally sensitive, context-specific, and equity-focused interventions to address reproductive health disparities and advance progress toward SDG 3 within tribal communities. This paper focuses on the reproductive health of tribal women in the ASR district, examining fertility patterns, maternal health, and family planning practices. It aims to identify barriers to healthcare access and suggest strategies to improve health services, promote gender equality, and support sustainable development in tribal areas.

II. STUDY AREA

The study is conducted in the Paderu region of Alluri Sitharama Raju (ASR) district, Andhra Pradesh, which is mainly inhabited by tribal communities. The area is geographically isolated, with hilly terrain and dense forests, poor road connectivity making access to healthcare and basic services difficult. These conditions negatively affect the reproductive health of tribal women, leading to high maternal and infant mortality, poor antenatal and postnatal care, and low use of institutional health services. Reproductive health in the region is strongly shaped by socio-economic and cultural factors such as early marriage, high fertility, malnutrition, low awareness of family planning, and dependence on traditional healing practices. Many women do not access modern healthcare due to lack of knowledge, cultural beliefs, and limited service availability. As a result, poor reproductive health outcomes and rapid population growth are common. The population largely comprises tribal communities such as Bagata, Goudu, Porja, Valmiki, Kummari, Khond, and Gadaba.

Population growth has increased pressure on natural resources and livelihoods, worsening poverty and inequality. Limited access to reproductive healthcare and family planning also slows progress towards the Sustainable Development Goals, especially SDG 3 (Good Health and Well-Being), SDG 5 (Gender Equality), and SDG 1 (No Poverty). Although the Paderu division has hospitals, PHCs, mobile medical units, and ambulance services, healthcare access remains limited, especially in remote villages. Shortages of doctors, long distances to facilities, and poor infrastructure reduce effective service delivery. Traditional beliefs about illness remain strong, and common diseases such as malaria, tuberculosis, and waterborne infections continue to affect health outcomes.

III. METHODOLOGY

The present study examines the reproductive health challenges faced by tribal women in Padabayalu and Chintapalli mandals of Paderu division of Alluri Sitharama Raju (ASR) district, Andhra Pradesh. A mixed-methods approach was adopted, combining quantitative and qualitative techniques to obtain a comprehensive understanding of reproductive health status, healthcare access, fertility behaviour, and the influence of socio-cultural factors. Chintapalli and Padabayalu mandals were purposively selected from the eleven tribal mandals of the Paderu division of the district, as they are representative of the predominantly tribal population, based on Census 2011 data.

Primary data were collected using stratified purposive sampling. Households with married women aged 15–45 years, having at least one living child aged between 1 and 10 years at the time of the survey, were selected as the unit of study. Data were gathered through a structured interview schedule, supplemented by observation to capture contextual and behavioural aspects related to reproductive health. In total, 345 households from 36 villages across the two mandals were covered. The study focused on key indicators such as Reproductive Health, Population dynamics, Socio cultural barriers, health service accessibility etc. In addition to primary data, secondary data were collected from official sources, including the Integrated Tribal Development Agency (ITDA), Paderu; the ASR District Statistical Handbook; and relevant government reports and records. These sources provided contextual information on demographic characteristics, healthcare infrastructure, and

development indicators, which supported and validated the primary findings. Quantitative data were analysed using descriptive and inferential statistical techniques with the help of SPSS software, while qualitative insights were used to enrich the interpretation of results.

IV. RESULTS

4.1 Background of respondents

Demographic and socioeconomic factors were significant health determinants. The table 1 shows that, 62.1 per cent respondents from Chintapalli belong to the Khond community; it is followed by the Porja (29.7 per cent) and Gadaba tribes (8.2 per cent), respectively. On the other hand, Pedabayalu has a starkly different composition. It was found that the Bagata community dominates, comprising 84.7% of the total surveyed sample. The Porja and Goudu communities were of 7.3% and 8.0%, respectively. 82.6 per cent respondents belong to Hindu religion (82.6 per cent), while the rest, 17.4 per cent of the respondents' were found to profess Christianity. In both Chintapalli and Pedbayalu, the majority of the population is Hindu, but the percentage of Hindus is higher in Pedbayalu (87.3%) compared to Chintapalli (79.0%).

Table: 1 Distribution of Respondents by Tribe and Mandal

Name of the Tribe	**Chintapalli**	**Pedbayalu**	**Total**
Khond	62.1 (121)	-	35.1 (121)
Porja	29.7 (58)	7.3 (11)	20.0 (69)
Gadaba	8.2 (16)	-	4.6 (16)
Bagata	-	84.7 (127)	36.8 (127)
Goudu	-	8.0 (12)	3.5 (12)
Total	**100.0 (195)**	**100.0 (150)**	**100.0 (345)**

Age significantly affects reproductive health, with younger women facing higher risks from early pregnancies, while women aged 20-35 typically experience healthier pregnancies. However, women over 35 face increased risks related to fertility and pregnancy complications, though these can be managed with proper healthcare

Table: 2 Mandal-wise Distribution of Respondents by Age

Age	**Chintapalli**	**Pedabayalu**	**Total**
16-20	7.7 (15)	2.7 (19)	9.8 (34)
21-25	17.9 (35)	18.0 (27)	17.9 (62)
26-30	33.3 (65)	32.0 (48)	32.7 (113)
31-35	14.4 (28)	14.0 (21)	14.2 (49)
36-40	15.9 (31)	15.3 (23)	15.6 (54)
41-45	9.7 (19)	6.7 (10)	8.4 (29)
46-50	1.0 (2)	1.3 (2)	1.1 (4)
Total	**100.0 (195)**	**100.0 (150)**	**100.0 (345)**

Table 2 reveals that the largest proportion of respondents (32.7%) across both regions is aged 26–30 years, followed by 21–25 years (17.9%) and 36–40 years age group (15.6%). The 31-35 age group comprises 14.2%, while 16-20 years makes up 9.8%. Smaller groups include 41-45 years (8.4%) and 46-50 years (1.1%). A similar pattern is observed in both mandals. In Chintapalli, most women are 26–30 years (33.3%), while in Pedabayalu, the largest group is also 26–30 years (32%). It is clear that most of the ever married women are found in the age group of 21-30 years with a mean age of 31.14± 8.32yrs years.

4.2.Reproductive Health Indicators

4.2.1 Age at first conception:

The age at first conception is critical aspect that influence maternal and child health outcomes in tribal communities. Teenage pregnancy increases health risks like maternal anemia, complications during childbirth, and high maternal mortality rates.

Table: 3 Age at First Conception of Respondents by Mandal

Age at first conception	**Chintapalli**	**Pedabayalu**	**Total**
<18years	32.3 (63)	48.0 (72)	39.1 (135)
>19yeras	67.7 (132)	52.0 (78)	60.9 (210)
Total	**100.0 (195)**	**100.0 (150)**	**100.0 (345)**

Table 3 shows the distribution of respondents by age at first conception in Chintapalli and Peda Bayalu mandals. About two-fifths (39.1%) of women had their first child before age 18, indicating that early childbearing is common in the study area. In Chintapalli, 32.3% conceived before 18, while 67.7% conceived at 19 or older. In Peda Bayalu, early conception is higher, with 48% experiencing their first pregnancy before 18, compared to 52% at 19 or later. This suggests that early marriage and childbearing are more prevalent in remote areas. Early first conception poses health risks and limits educational and decision-making opportunities for tribal women.

4.2.2. Maternal Mortality Rate

Maternal mortality among tribal women remains high due to limited access to healthcare services, shortage of skilled birth attendants, inadequate antenatal and postnatal care, poor nutrition, early marriage, and low awareness of maternal health. Economic constraints and deeply rooted cultural practices often delay timely medical care, increasing the risk of complications and death during pregnancy and childbirth. The maternal mortality rate (MMR) in the study area is 204 maternal deaths per 100,000 live births, which is equivalent to about 0.2 maternal deaths per 100 live births, or approximately one maternal death for every 490 live births. This figure is significantly higher than the national average of 97 and the Andhra Pradesh state average of 45. Such a wide gap clearly indicates poor maternal health outcomes in the tribal areas of the study region and highlights the urgent need to strengthen maternal healthcare services, improve access to skilled care, and enhance awareness among tribal women.

4.2.3.Fertility Rate

In Padabayalu and Chintapalli Mandals, women have an average of 3.4 and 3.2 children, respectively, which is much higher than the national average of 2.3 and the Andhra Pradesh state average of 1.5. This higher fertility among tribal women reflects a combination of cultural practices, limited awareness, and restricted access to reproductive health services, family planning, and maternal care. Frequent pregnancies and short intervals between births increase the risk of maternal and child health complications, including anemia, pregnancy-related complications, and maternal mortality, which is reflected in the high maternal mortality rate of 204 per 100,000 live births in the region. These reproductive patterns also influence population dynamics, leading to faster population growth and placing additional pressure on already limited resources such as healthcare, education, and nutrition.

4.2.4. Contraceptive use

Many women in the study area have limited awareness of modern family planning methods and are often reluctant to use them due to concerns about side effects, religious beliefs, or opposition from male family members. Traditional practices, such as birth spacing through local methods or consulting traditional healers for

fertility regulation, remain common. Local leaders also play a significant role in either supporting or hindering family planning initiatives.

Family planning is crucial for improving tribal women's health, economic stability, and empowerment. Table 4 shows that contraceptive use is low, with a heavy reliance on sterilization and traditional methods. Overall, 37.7% of respondents use some form of contraception. Among them(N=130), male sterilization is the most common (45.4%), followed by female sterilization (34.6%). Traditional tribal methods are used by 14.6%, while condoms and oral pills are less common (4.6% and 0.8%, respectively). In Chintapalli, male sterilization (50.7%) and traditional methods (27.5%) dominate, with no reported use of condoms or oral pills. In Pedabayalu, female sterilization (49.2%) is more common, along with some use of condoms (9.8%) and oral pills (1.6%).

Table: 4 Mandal wise Adoption of Family Planning Methods

Family planning	**Chintapalli**	**Pedabayalu**	**Total**
Any method	35.4 (69)	40.7 (61)	37.7 (130)
Female sterilization	21.7 (15)	49.2 (30)	34.6 (45)
Male sterilization	50.7 (35)	39.4 (24)	45.4 (59)
Traditional tribal methods	27.5 (19)	-	14.6 (19)
Condoms	-	9.8 (6)	4.6 (6)

4.2.5. Cultural Attitudes towards Family Planning

Traditional practices, such as using local methods for birth spacing or consulting traditional healers for fertility regulation, are common in these areas. Many women are reluctant to adopt modern contraceptives due to fears of side effects, religious beliefs, or opposition from male family members. Local leaders also have a significant influence, either supporting or hindering family planning initiatives.

4.3. Socio Cultural Barriers

4.3.1. Early Marriage

Early marriage in tribal communities, often occurring before the legal minimum age of 18, is a significant factor affecting reproductive health. It typically leads to early pregnancies, which pose risks such as maternal and infant mortality, preterm births, low birth weight, and complications like gestational hypertension or preeclampsia.

Table 5: Age at marriage of the respondents by Mandal

Age at Marriage	**Chintapalli**	**Pedabayalu**	**Total**
≤ 15 years	20.0 (39)	34.7 (52)	26.4 (91)
16-17 years	17.4 (34)	30.7 (46)	23.2 (80)
18-19 years	27.7 (54)	14.6 (22)	22.0 (76)
20 -21years	29.7 (58)	12.0 (18)	22.0 (76)
>22years	5.2 (10)	8.0 (12.0)	6.4 (22)
Total	**100.0 (195)**	**100.0 (150)**	**100.0 (345)**

Table 5 shows that a large proportion of respondents in both regions marry early. Around one-fourth (26.4%) of women married at or before the age of 15, 23.2% between 16 and 17 years, and 22% between 18 and 19 years. About 26.2% married above 20 years. In Chintapalli, 20% married at or before 15, 27.7% between 18

and 19 years, and 34.9% above 20 years. In Pedabayalu, early marriage is more common, with 34.7% marrying at or before 15 and 30.7% between 16 and 17 years, while only 20% married after 20 years.

4.4 Population Dynamics

Population dynamics, changes in population size, distribution, and structure are intricately linked to access to reproductive health services: Tribal populations in study area often exhibit unique demographic characteristics, including higher fertility rates, early marriages and lower contraceptive use. High fertility rates, compounded by limited access to reproductive health services, contribute to rapid population growth, which can strain local resources and impede sustainable development.

4.4.1. Population Growth

The fertility rate in the study region is higher than the state average, leading to varying population growth across the mandals. In Chintapalli, the decadal growth rate is 11.24% (1.06% annually), indicating rapid population increase due to high fertility, limited reproductive health services, and possible in-migration. This rapid growth strains resource like healthcare, education, water, and food, and can cause overcrowding, stressed infrastructure, and fewer job opportunities. In contrast, Peda Bayalu has a slower decadal growth rate of 2.08% (0.21% annually), likely due to lower fertility, better access to health services, or out-migration for work and education.[14]. Slower growth reduces pressure on local resources but may bring challenges such as an aging population and fewer young workers. These differences show how fertility and reproductive health directly affect population growth and highlight the need for sustainable development planning in tribal areas.

4.4.2. Dependency ratio

The dependency ratio in the study area is high, as most of the population is young, with many children and dependents. The dependency ratio measures the number of dependents (children and elderly) compared to the working-age population, which affects reproductive health and sustainable development. High dependency creates challenges for maternal health, as many young women face early pregnancies and higher childbirth risks due to limited healthcare and cultural norms. In Chintapalli, the dependency ratio is 57.2%, indicating high fertility and limited access to reproductive health services. This places a heavy burden on the working population, affecting economic growth, resource use, and public services. In contrast, PedaBayalu has a lower ratio of 46.6%, reflecting better reproductive health access, fewer dependents, and a more balanced population, which supports economic productivity and sustainable development.

4.4.3. Migration patterns

Many tribal communities, traditionally settled in their villages, are increasingly migrating seasonally, especially younger members, due to limited local employment. This migration affects community stability and reduces access to healthcare and education. The district's hilly terrain in the Eastern Ghats contributes to seasonal, urban, and inter-state migration, with residents seeking work in nearby cities like Visakhapatnam or in neighboring states such as Telangana and Odisha, mainly in construction and industry. Migration can limit women's access to proper maternal care, while the lack of local job opportunities increases economic vulnerability.

High population growth, combined with a significant dependency ratio, further strains resources such as healthcare, water, and food. Population growth rates in PedaBayalu and n Chintapalli are unsustainable, creating barriers to achieving SDG 1 (No Poverty) and SDG 3 (Good Health and Well-Being). A growing number of dependents, especially children, limits economic mobility for families and communities, worsening poverty.

4.5. Traditional Beliefs and Health Care utilization

4.5.1. Institutional deliveries and skill birth attendant

Home deliveries remain common among tribal women in remote areas due to cultural beliefs, limited transportation, and reliance on traditional birth attendants (TBAs). Such deliveries carry risks, including infections, prolonged labor, postpartum hemorrhage, and higher maternal and infant mortality. TBAs often use non-sterile tools and traditional methods, and post-delivery care may involve herbal remedies or unsafe practices, such as cutting the umbilical cord with bamboo knives or household scissors. Some also perform rituals that may affect maternal recovery. Table 6 shows that the majority of births (76.8%) occur at home, while 21.1% take place in government health facilities and only 2.1% in private facilities. This pattern is similar in both mandals: Chintapalli reports 76.9% home births, 22.1% in government facilities, and 1% in private facilities, while Pedabayalu has 76.7% home births, 20% in government facilities, and 3.3% in private facilities.

Table 6 : Mandal-wise Distribution of Women by Place of Delivery of Last Birth

Place of delivery	**Chintapalli**	**Pedabayalu**	**Total**
Home	76.9 (150)	76.7 (115)	76.8 (265)
GHF	22.1 (43)	20.0 (30)	21.1 (73)
PHF	1.0 (2)	3.3 (5)	2.1 (7)
Total	**100.0** **(195)**	**100.0** **(150)**	**100.0** **(345)**

Table 7 highlights the reliance on untrained birth attendants (UTBAs): in Chintapalli, 50.7% of home deliveries are assisted by UTBAs and 32% by elder ANMs. In Pedabayalu, 80% of home births rely on UTBAs, with only 7.8% assisted by ANMs. These figures indicate a critical shortage of trained healthcare workers, raising serious concerns about maternal and infant safety.

Table: 7 Mandal-wise Distribution of Women by Birth Attendant for Last Birth

Birth attendant	**Chintapalli**	**Pedabayalu**	**Total (N=265)**
ANM	32.0 (48)	7.8 (9)	21.5 (57)
UTBA	50.7 (76)	80.0 (92)	63.4 (168)
Elder person	16.0 (24)	9.6 11	13.2 (35)
Community health worker	1.3 (2)	7.8 (3)	1.9 (5)
Total	**100.0** **(150)**	**100.0** **(111)**	**100.0** **(265)**

4.6. Health Service Accessibility

Access to healthcare is vital for the well-being of the tribal population in the Paderu division of the ASR district, Andhra Pradesh. However, the region's remote and hilly terrain in the Eastern Ghats poses serious challenges to accessing modern healthcare services. Many tribal habitations are located far from health facilities, making timely medical attention difficult, particularly during emergencies. Physical distance remains a major barrier. In Chintapalli mandal, the nearest District Medical and Health Office (DMHO) is located 56 km away in Paderu, while Pedabayalu mandal is 33 km from Paderu. Poor road connectivity, limited public transportation, and high travel costs further restrict access to healthcare services. These constraints discourage routine health visits and delay treatment. Shortages of healthcare personnel further weaken service delivery. In Chintapalli, 12 doctors and 28 nurses serve a population of 71,640, resulting in a doctor–population ratio of 1:7,164. In Pedabayalu, 4 doctors and 12 nurses cater to 51,890 people, with a ratio of 1:12, 973.[14]. These figures are far below recommended standards, leading to overcrowding, long waiting times, and inadequate quality of care. The lack of specialist services compels most patients to depend on general practitioners for diverse health needs. Limited access to healthcare contributes to the high prevalence of preventable and treatable diseases such as malaria, respiratory infections, waterborne diseases, and malnutrition. The absence of regular health check-ups, immunization, and preventive services results in untreated conditions, especially among children.

Table 8 reveals that maternal healthcare access is limited in the study area. While 56.2% of women reported receiving antenatal care (ANC), a significant 43.8% did not use these services.. The reasons cited by women for not accessing ANC include the belief that such care is unnecessary, cultural practices that do not encourage institutional care, lack of awareness about ANC services, long distances to health centres, and poor quality of services available.

Table 8: Mandal-wise Distribution of Women by Antenatal Care (ANC) Utilization

Approach for ANC	Chintapalli	Pedabayalu	Total
Yes	56.9 (111)	55.3 (83)	56.2 (194)
No	43.1 (84)	44.7 (67)	43.8 (151)
Total	**100.0 (195)**	**100.0 (150)**	**100.0 (345)**

Table 9 shows that among women who accessed ANC (N=194), frontline health workers were the main providers. In Chintapalli, 66.7% received care from ANMs, 18% from doctors, 10.8% from untrained birth attendants, and 4.5% from traditional birth attendants. In Pedabayalu, 45.8% relied on ANMs, 38.5% on doctors, and 13.2% on TBAs. While ANMs are the primary providers in both mandals, Pedabayalu shows a higher use of doctors and traditional attendants.

Table : 9 Mandal-wise Distribution of Women by ANC Provider

ANC provider	Chintapalli	Pedabayalu	Total (N=194)
Doctor	18.0 (20)	38.5 (32)	26.8 (52)
ANM	66.7 (74)	45.8 (38)	57.7 (112)
UTBA	10.8 (12)	2.4 (2)	7.2 (14)
TBA	4.5 (5)	13.2 (11)	8.3 (16)
Total	100.0 (111)	100.0 (83)	100.0 (194)

Despite the presence of modern healthcare facilities, traditional healing practices remain widespread due to strong cultural beliefs. The study found that over half of the respondents (55.6%) reported consulting traditional healers. While these practices provide cultural comfort, they often delay access to medical care and contribute to poor health outcomes. In maternal and child health, reliance on traditional birth attendants (TBAs) and home deliveries increases the risk of complications, infections, and higher maternal and neonatal mortality.

Low levels of health education further limit awareness about disease prevention and timely treatment. Many community members attribute illness to supernatural causes, discouraging the use of modern healthcare services. Economic constraints also exacerbate healthcare inaccessibility, as the costs of travel, medicines, and diagnostic tests are unaffordable for many households, resulting in delayed or forgone treatment.

4.7 Role of Education and Economic Factors

Education plays a crucial role in improving reproductive health by increasing awareness of family planning, maternal care, and safe childbirth practices. Low education levels among tribal women limit their understanding of contraception, antenatal care, and other reproductive health services, contributing to poor health outcomes. This increases risks such as unintended pregnancies, maternal complications, and higher maternal and infant mortality. Economic factors also impact reproductive health. Tribal women engage in agriculture, forest-based work, and wage labor, often continuing physically demanding tasks during pregnancy and shortly after childbirth. These conditions raise the risk of complications, miscarriages, preterm births, and poor postnatal recovery.

Table 10 shows a significant educational gap among women in both mandals. Overall, 66.4% of respondents were illiterate. Only 14.5% completed primary education, 10.4% reached secondary school, 5.8% completed intermediate, 1.7% held a degree, and 1.2% had technical education. Illiteracy was much higher in Chintapalli (84.1%) than in Pedabayalu (43.3%). Pedabayalu had better educational attainment at the primary (26.7%) and secondary (14.7%) levels, though higher education remained rare in both areas. This low level of education limits women's ability to make informed decisions about their reproductive health.

Table 10: **Mandal-wise Educational Level of Respondents**

Education	**Chintapalli**	**Pedabayalu**	**Total**
Illiterate	84.1 (164)	43.3 (65)	66.4 (229)
Primary	5.1 (10)	26.7 (40)	14.5 (50)
Secondary	7.2 (14)	14.7 (22)	10.4 (36)
Intermediate	2.6 (5)	10.0 (15)	5.8 (20)
Degree	0.5 (1)	33 (5)	1.7 (6)
Technical	0.5 (1)	2.0 (3)	1.2 (4)
Total	**100.0 (195)**	**100.0 (1500**	**100.0 (345)**

Table 11 shows the occupation-wise distribution of respondents. Agriculture is the main occupation, involving 58.8% of women across both mandals. In Chintapalli, a higher proportion of women work in agriculture (72.8%) compared to Pedabayalu (40.7%). Agricultural labour is more common in Pedabayalu (32%) than in Chintapalli (5.2%). General labour is slightly higher in Chintapalli (19.5%) than in Pedabayalu (10%). Formal employment is very limited, with only 2.9% engaged in private jobs across both mandals. Interestingly, 10.6% of women in Pedabayalu are housewives, while none in Chintapalli identify as such, indicating that most women in Chintapalli are involved in income-generating activities, often under physically demanding conditions. The combination of low education, economic necessity, and heavy workload negatively impacts women's reproductive health and limits their access to healthcare.

Table 11: Occupation of the Respondents by Mandal

Occupation	**Chintapalli**	**Pedabayalu**	**Total**
Private job	2.6 (5)	3.3 (5)	2.9 (10)
Agriculture	72.8 (142)	40.7 (61)	58.8 (203)
Agricultural labour	5.2 (10)	32.0 (48)	16.8 (58)
Labour	19.5 (38)	10.0 (15)	15.4 (53)
Teacher	- 	2.7 (4)	1.1 (4)
Community Social worker	-	0.7 (1)	0.3 (1)
Housewife	- -	10.6 (16)	4.6 (16)
Total	100.0 (195)	100.0 (150)	100.0 (345)

V. DISCUSSION

The reproductive health status and population dynamics of tribal women in Chintapalli and Pedabayalu mandals reveal serious challenges to sustainable development in the region. The findings indicate that high fertility, early marriage, adolescent pregnancy, and strong cultural practices continue to shape reproductive behaviour. These issues are further intensified by geographical isolation, poor healthcare infrastructure, and limited female autonomy in health-related decision-making.

Adolescent pregnancy is alarmingly high in both mandals, particularly in Pedabayalu (48%) and Chintapalli (33%), compared to the national average of about 7 per cent. Early marriage and early childbearing expose young women to greater risks of pregnancy-related complications and negatively affect child health

outcomes. These patterns also reinforce intergenerational cycles of poverty and poor health. The maternal mortality rate in the study area (204 per 100,000 live births) is significantly higher than the state and national averages, reflecting limited access to skilled healthcare providers, inadequate antenatal care, and poor emergency obstetric services.

Fertility levels in both mandals remain extremely high, with 3.4 children per woman in Pedabayalu and 3.2 in Chintapalli, nearly double the national average. Low contraceptive use, combined with dependence on sterilisation and traditional methods, indicates poor awareness of modern family planning and deep-rooted cultural resistance to spacing methods. These trends contribute to rapid population growth, placing heavy pressure on local resources such as healthcare, food, and water. Population growth rates of 3.8 per cent in Pedabayalu and 3.4 per cent in Chintapalli pose serious challenges to achieving SDG 1 (No Poverty) and SDG 3 (Good Health and Well-Being).

Cultural practices continue to play a major role in shaping reproductive health outcomes. Early marriage, home-based deliveries, and reliance on traditional birth attendants remain common. A large proportion of women prefers home births (76.9%) and depends on unqualified providers (55.6%), reflecting strong trust in traditional systems and limited confidence in modern healthcare. Very low awareness of modern family planning methods further constrains efforts to improve maternal and reproductive health. Low levels of female education strongly influence reproductive health behaviour in both mandals. A substantial proportion of women are illiterate, 43.3 per cent in Pedabayalu and 84.1 per cent in Chintapalli restricting their understanding of reproductive health, contraception, and maternal care. Limited education also reduces women's decision-making power and reinforces dependence on traditional practices. Economically, most women are engaged in agriculture or household-based activities that involve physical labour. Poor health, combined with low educational attainment, restricts economic mobility and limits opportunities for improving living standards, thereby sustaining cycles of poverty and vulnerability.

VI. RECOMMENDATIONS

The following are some of the recommendations

- Build and strengthen healthcare centers in remote areas and provide transportation to improve access.
- Use mobile health units to deliver maternal and reproductive health services, including antenatal and postnatal care.
- Train local health workers, including ASHA workers, in family planning, maternal health, and emergency care.
- Conduct community programs to raise awareness about modern contraception, maternal health, and reproductive rights.
- Involve men in family planning discussions to increase acceptance and reduce resistance.
- Introduce sexual and reproductive health education in schools to address early marriage, contraception, and gender equality.
- Work with local leaders to support family planning and maternal health initiatives.
- Respect local traditions while gradually promoting evidence-based healthcare practices.
- Enforce the legal age of marriage and provide incentives to delay marriage and childbearing.
- Improve education for girls and women, including health education and skill-building programs.
- Promote vocational training to increase women's economic independence and reduce reliance on strenuous work.
- Collect regular data on reproductive health, maternal mortality, contraceptive use, and population growth to monitor and improve interventions.

VII. CONCLUSION

The reproductive health of tribal women in Padabayalu and Chintapalli Mandals remains a major concern, affecting overall sustainable development in the region. High fertility, early pregnancies, limited access to modern healthcare, and cultural barriers challenge the achievement of SDG 3 (Good Health and Well-Being), SDG 5 (Gender Equality), and SDG 1 (No Poverty). Addressing these issues requires a comprehensive approach that combines better healthcare, education, community involvement, and economic development. Improving access to quality health services, raising awareness about family planning, overcoming cultural barriers, and empowering women through education and livelihoods can enhance reproductive health, reduce maternal mortality, and support sustainable development. Achieving these goals depends on coordinated efforts by government agencies, healthcare providers, community leaders, and the tribal communities themselves. Empowering women with knowledge and resources to make informed reproductive choices will not only improve their health and well-being but also contribute to the overall growth and development of the region.

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