

MAPPING OF STATE-WISE SEX RATIO IN INDIA, 1961 - 2011

A report submitted in partial fulfilment of the requirements for the course
Code **UGETM50202** Course **Basics of GIS** as part of Minor Course in Fifth
Semester

Of BA/BSc offered by the Department of Geography

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Certificate

This is to certify that **Shahin Sharaf Konnola** has successfully completed the project entitled **Mapping of State - Wise Sex-Ratio in India, 1961 - 2011**, as part of the Course Code **UGETM50202** Course **Basics of GIS** under National Education Policy (NEP) 2020.

This course, comprising 4 credits, was designed to provide students with a comprehensive understanding of basic techniques and the principles of GIS. The course enabled hands-on experience with various mapping tools and technologies.

We commend **Shahin Sharaf Konnola** for his dedication and hard work.

Dr. Pankaj Roy
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Acknowledgement

I express my sincere gratitude to Dr. Pankaj Roy for his dedication and his support throughout the course ***Course Code: UGETM50202 Course: Basics of GIS***. The project and comprehensive coverage of thematic mapping techniques and principles of GIS have significantly enriched my knowledge and skills in this field.

The hands-on experience with the interactive sessions of training and practical assignments allowed me to apply concepts such as spatial data analysis, mapping techniques, and geovisualization directly to real-world scenarios. Working with tools like Quantum GIS & ArcGIS enhanced my understanding of how to manipulate and visualize spatial data effectively.

I also appreciate the Department of Geography for this course that has significantly contributed to my academic journey and has inspired me to further explore the field of Geographic Information Science.

I look forward to applying the skills and knowledge acquired from this course in future.

Yours sincerely,

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Abstract

India been very dense in population throughout years and lots of questions are arises on gender inequalities. So, this project presents a comprehensive analysis of the sex ratio in India from 1961 to 2011, utilizing Quantum Geographic Information System (QGIS) technology for spatial mapping and visualization.

The sex ratio, defined as the number of females per 1,000 males, is a critical demographic indicator reflecting gender balance and societal health. This study employs historical census data to examine trends and disparities across various Indian states over a fifty-year period through Census of India, by Office of the Registrar General of India. The analysis highlights significant variations in sex ratios, identifying regions with alarming deficits and others with more favourable conditions. By employing GIS tools, the project facilitates the visual representation of these disparities, enabling a clear-cut understanding of geographical patterns and their socio-economic implications. Key factors influencing changes in the sex ratio, such as cultural practices, economic development, and government policies, are also explored. The findings underscore the importance of targeted interventions to address gender imbalances and promote gender equity in the country. Through this work, we aim to foster greater awareness on the overall socio-economic landscape of the nation.

Introduction

The demographic structure of a population provides crucial insights into the socio-economic and cultural dynamics of a country. Among various demographic indicators, the sex ratio—defined as the number of females per 1,000 males—is a significant metric that reflects gender balance and highlights underlying societal trends. In India, the sex ratio has evolved over time, influenced by a complex mix of social, economic, and regional factors. Tracking these changes provides valuable insights into how policies, cultural shifts, and economic developments have impacted gender dynamics across states.

Historically, India's sex ratio has been unfavourable to females, reflecting deep-rooted patriarchal norms and preferences for male offspring. The census data reveals alarming trends: from a sex ratio of 976 in 1961, it plummeted to 940 by 2011. This decline has been particularly pronounced in child sex ratios (CSR), which reached a concerning low of 914 in 2011. Such figures highlight the urgent need for awareness and intervention regarding gender discrimination and the societal value placed on female children.

This project leverages Geographic Information System (GIS) technology to create a comprehensive, state-wise map of India's sex ratio from 1961 to 2011. GIS enables precise spatial visualization and analysis, offering a dynamic perspective on demographic data over multiple decades. By visualizing these changes, we aim to highlight regional disparities, identify trends, and provide a foundation for further research into the social and policy implications of these shifts. This project not only aids in understanding historical demographic trends but also emphasizes the importance of data-driven approaches in addressing gender-based issues across diverse regions of India.

Literature Survey

India, our country seems to male majority is very high throughout history, were gender equality becoming basic component of a strong nation. In this study we took data of 50 years from Indian survey which took state wise, were overall India took decline until 70s and start growing until 11s. So basically, we can see several reports showing about different acts came up in India which helps to regulate the decline happened in 70s. Also, we can see the urban areas and rural areas also varies in this ratio. We can assume that it may the reasons of such law enforcements in urban area which is straight forward.

In some reports we can see that the major reasons of decline in sex ratio was sex-selective abortion, Higher female mortality rate, Cultural preference, Economic Factors were there. So government of India took various measure to reverse this process. Many of the families in India were prefered more on male childrens were given them nutritious food and quality education. Were female mortality and health become lower. Hence Indian Government took some measures that Legislative actions such as Pre-Conception and Pre-Natal Daignostics Act,1994, Public awarness classes like Beti Bachao Beti Padhao, Community intervotions of NGOs for grassroot level education on importance of female children, their health, education, financial incentives for taking care of girl child, Monitoring and evaluation for betterment of strategies and Health Care improvements during and after birth of girl child (ii)

Hence we can also see survey reports, Some districts have high in sex ratio meanwhile some of the states are backward in this. There are severel factors in this variations among each states. So, We can see that several reports are point in same dierections.

Objective

Mapping of Sex Ratio in India from 1961 to 2011.

Sex Ratio: In India.

The sex ratio has generally improved at the national level. For example, the sex ratio in states such as Andhra Pradesh has remained rather constant (when adjusted for census years), changing only marginally from 981 in 1961 to 993 in 2011. This incremental increase indicates a progress in gender parity through the years. Yet in certain places, things changed more sharply than others; suggesting that gender parity has not only been some sort of slow process.

Table 1: Sex Ratio in India 1961 -2011

	1961	1971	1981	1991	2001	2011
ANDAMAN & NICOBAR ISLANDS	617	644	760	818	846	876
ANDHRA PRADESH	981	977	975	972	978	993
ARUNACHAL PRADESH	894	861	862	859	893	938
ASSAM	869	896	910	923	935	958
BIHAR	1005	957	948	907	919	918
CHANDIGARH	652	749	769	790	777	818
CHHATTISGARH	1008	998	996	985	989	991
DADRA & NAGAR HAVELI	963	1007	974	952	812	774
DAMAN & DIU	1169	1099	1062	969	710	618
DELHI	785	801	808	827	821	868
GOA	1066	981	975	967	961	973
GUJARAT	940	934	942	934	920	919
HARYANA	868	867	870	865	861	879
HIMACHAL PRADESH	938	958	973	976	968	972
JAMMU & KASHMIR	878	878	892	896	892	889
JHARKHAND	960	945	940	922	941	948
KARNATAKA	959	957	963	960	965	973
KERALA	1022	1016	1032	1036	1058	1084
LAKSHADWEEP	1020	978	975	943	948	946
MADHYA PRADESH	932	920	921	912	919	931
MAHARASHTRA	936	930	937	934	922	929
MANIPUR	1015	980	971	958	974	985
MEGHALAYA	937	942	954	955	972	989
MIZORAM	1009	946	919	921	935	976
NAGALAND	933	871	863	886	900	931
ODISHA	1001	988	981	971	972	979
PUDUCHERRY	1013	989	985	979	1001	1037
PUNJAB	854	865	879	882	876	895
RAJASTHAN	908	911	919	910	921	928
SIKKIM	904	863	835	878	875	890
TAMIL NADU	992	978	977	974	987	996
TRIPURA	932	943	946	945	948	960
UTTAR PRADESH	907	876	882	876	898	912
UTTARAKHAND	947	940	936	936	962	963
WEST BENGAL	878	891	911	917	934	950
INDIA	941	930	934	927	933	943

source: Census of India 2011, Office of the General Registrar of India

For instance, the states of Haryana and Punjab in northern India have lower sex ratios compared to other states which may be reflective of historical preference for male children. The association between this cultural preference and factors like inheritance customs and dependence on male labour has been widely studied. On the contrary, states in south India and north-east like Kerala and Manipur show a higher sex ratio which represents they have a better sex ratio than those with poor gender equality. Especially among the top five in sex ratios over this entire period was Kerala, which benefited from high literacy rates, progressive social policies and a greater focus on women's health.

From decade to decade there are different shifts, and some decades show more drastic changes than others. For example, the 1990s witnessed a sharp increase in sex ratio in several states that are possibly correlated with progressive policies and rising consciousness towards gender equality. This was true for states like Arunachal Pradesh that improved their sex ratio from 859 per thousand boys in 1991 to 938 in 2011, possibly fuelled by educational reforms and economic development. Likewise, their 1961 ratio of 617 improved through to one of the highest ratios in the country by 2011 (876), though it remained seriously below parity.

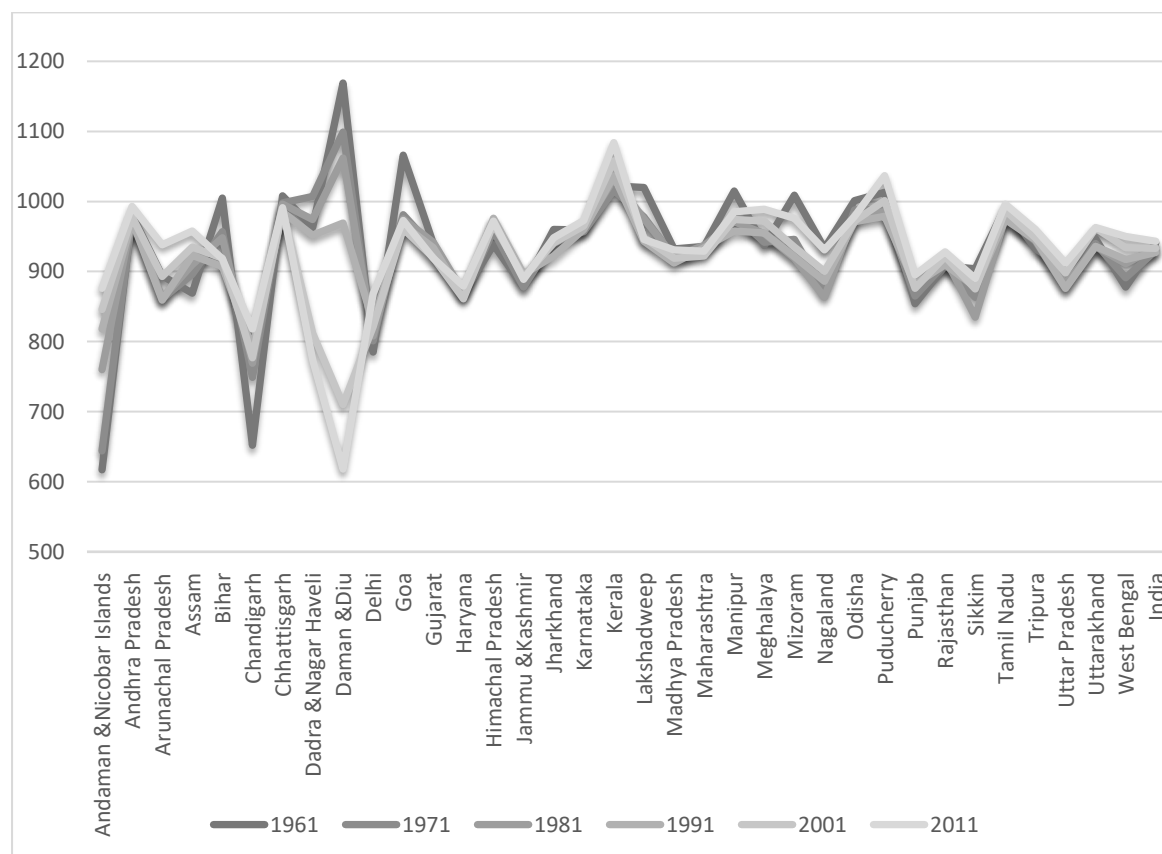


Fig: Sex Ratio Graph, 1961 -2011

This might be because northern Indian states like Haryana and Punjab have traditionally had a low sex ratio, probably indicating the old gender bias of male child preference. Such the cultural bias has connected with some social aspects such as heritage practices and dependence on male job. This contrasts with states in southern and northeastern India, like, Kerala and Manipur which generally exhibit a higher sex ratio and therefore less imbalance between the male and female population. In contrast, Kerala had one of the more favourable sex ratios during this whole period, a credit to its high literacy rates, progressive social policies and greater emphasis on women's health.

A over ten year look at the changes shows some decades are more impactful than others. This may be the kind of trend that we have been looking to happen for decades – in the 1990s for example there were significant gains in sex ratio among many states which was likely a consequence of progressive policy and developing awareness about issues of gender. Arunachal Pradesh and other states also saw a rise in their sex ratio, from 859 in 1991 to 938 in the year 2011 because of reforms in education facilities and development of economy (267). With a gain of 259 points, the Andaman and Nicobar Islands follows closely with one of the highest improvements, taking its ratio from 617 in 1961 to 876 by 2011 – but still below the national average for this period.

These variances could be due to growing access to healthcare, selective social initiatives or creation of legal mechanisms effective against gender-biased customs. The PCPNDT (Pre-Conception and Pre-Natal Diagnostic Techniques) Act of 1994, to combat the sex-selective abortion might have helped in taking a few regions to a more balanced sex ratio.

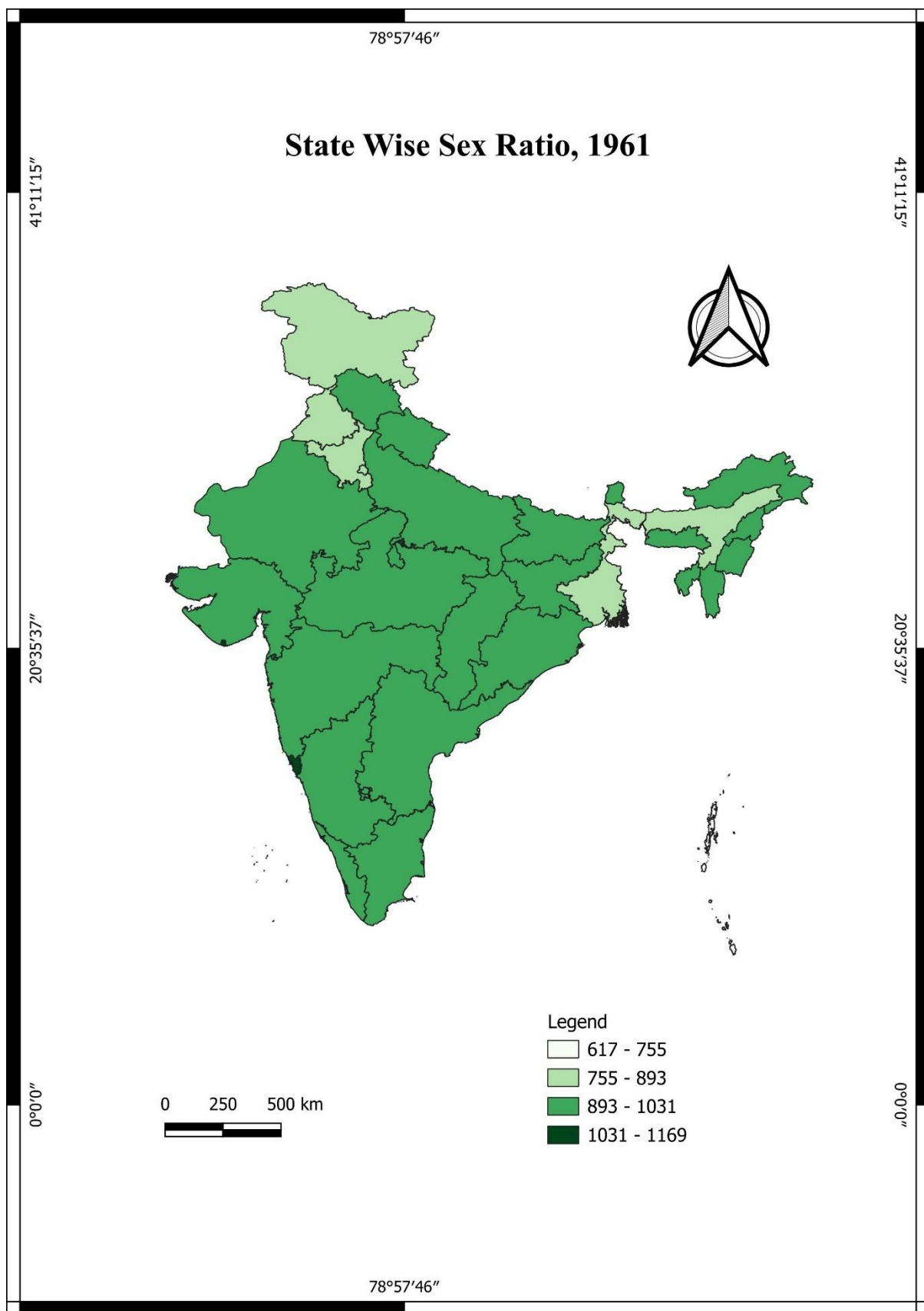


Fig1: State Wise Sex Ratio (1961), Source: Census of India, Office Registrar of India

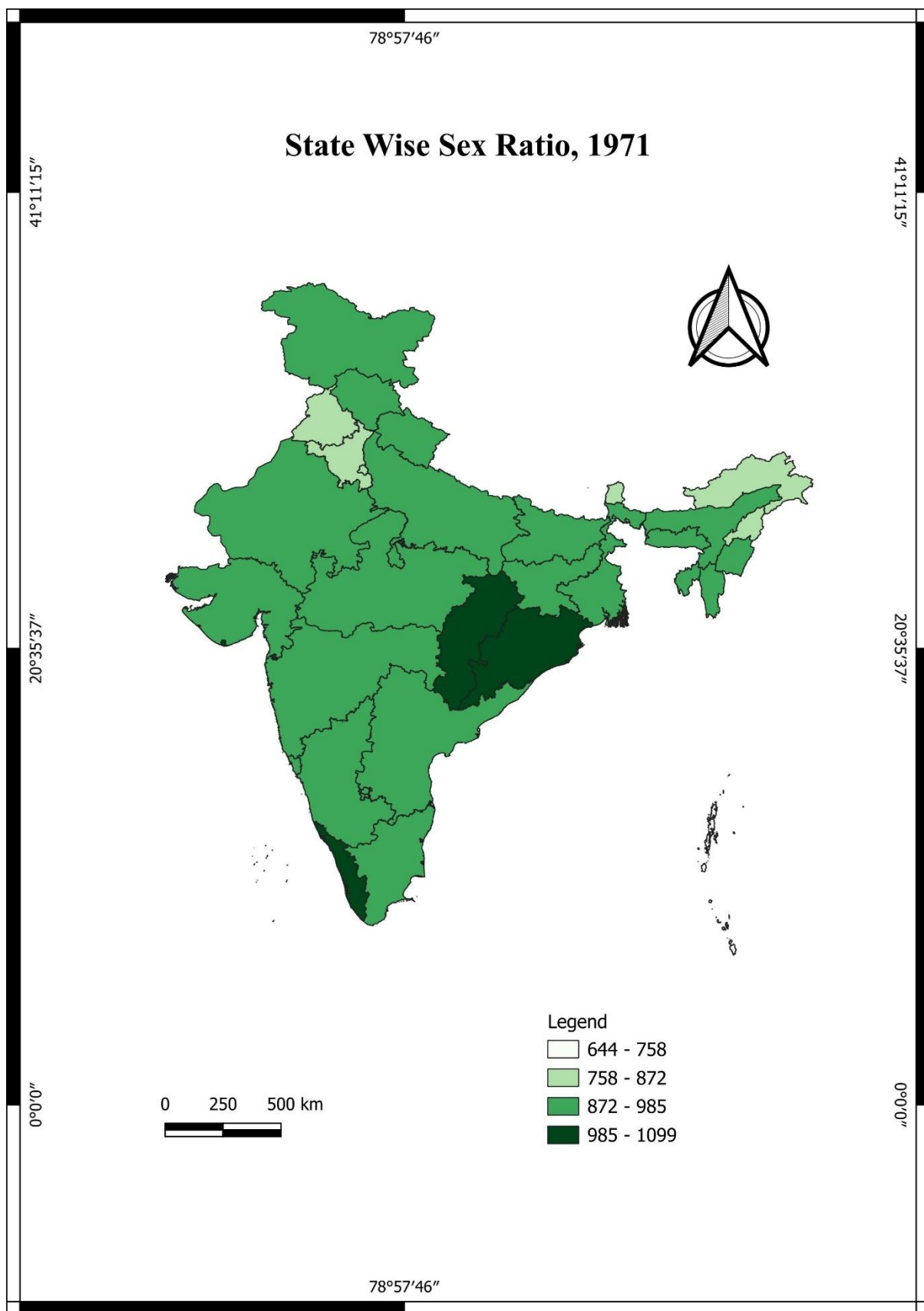


Fig2: State Wise Sex Ratio (1971), Source: Census of India, Office Registrar of India

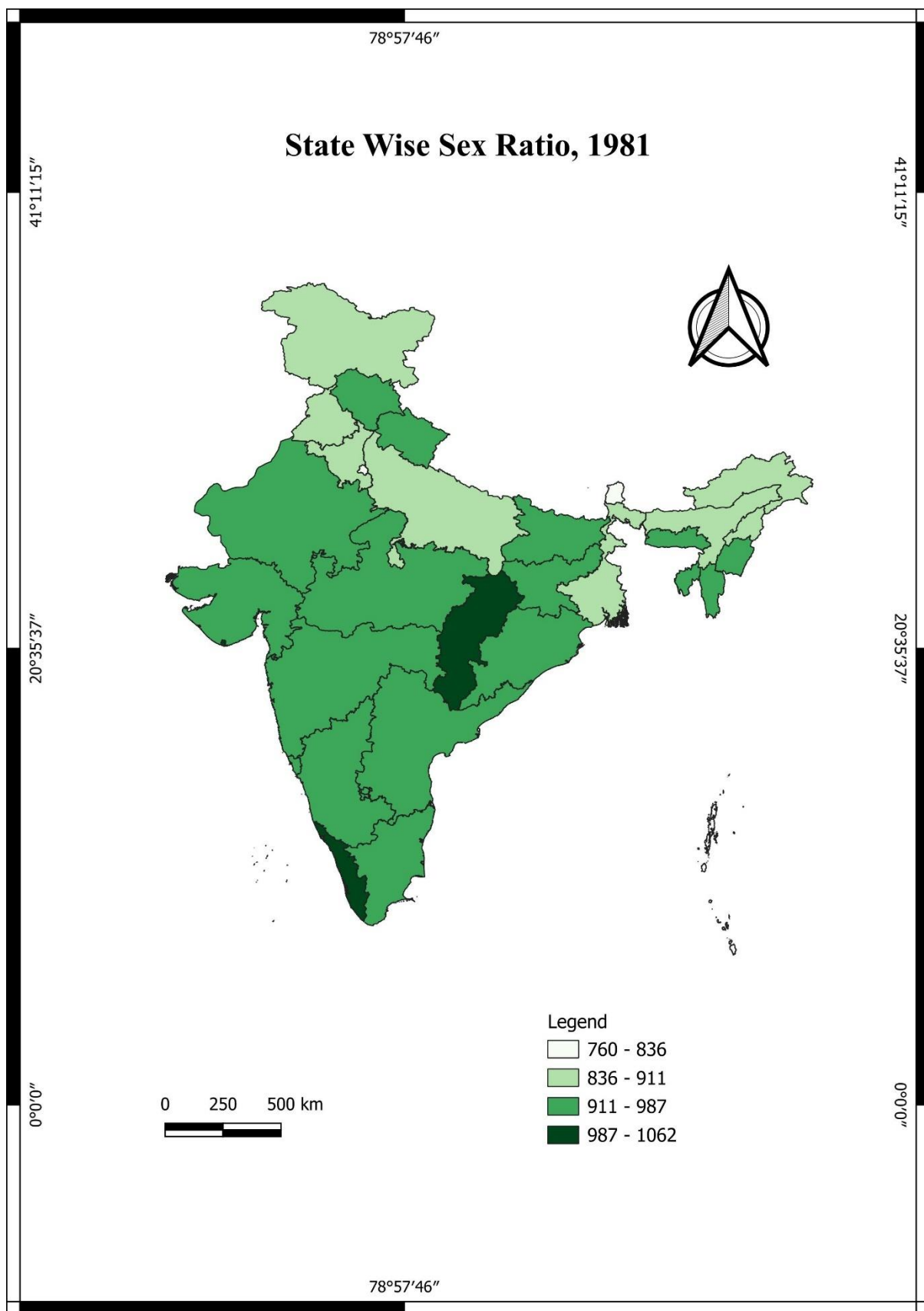


Fig3:State Wise Sex Ratio (1981), Source: Census of India, Office Registrar of India

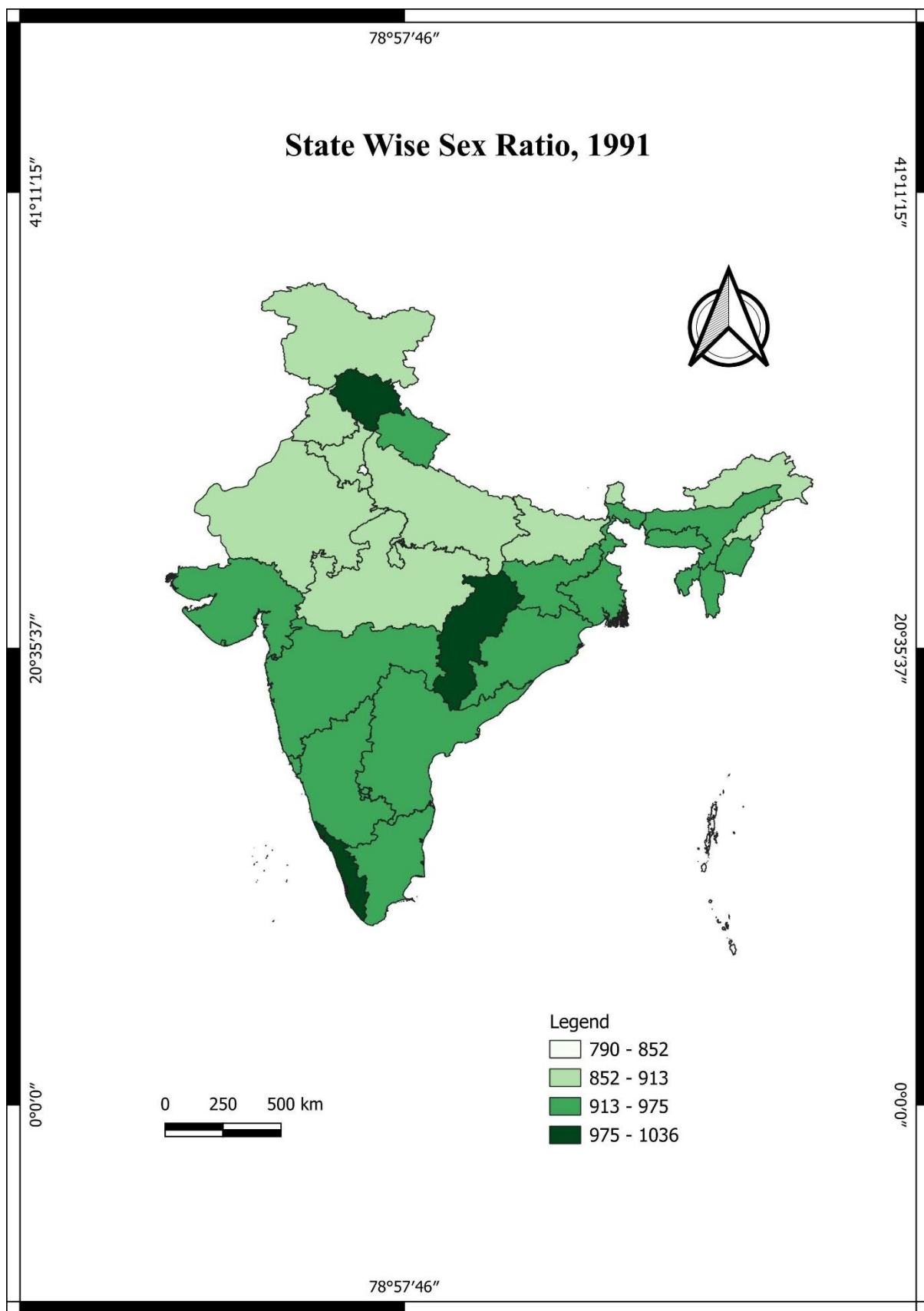


Fig4:State Wise Sex Ratio (1991), Source: Census of India, Office Registrar of India

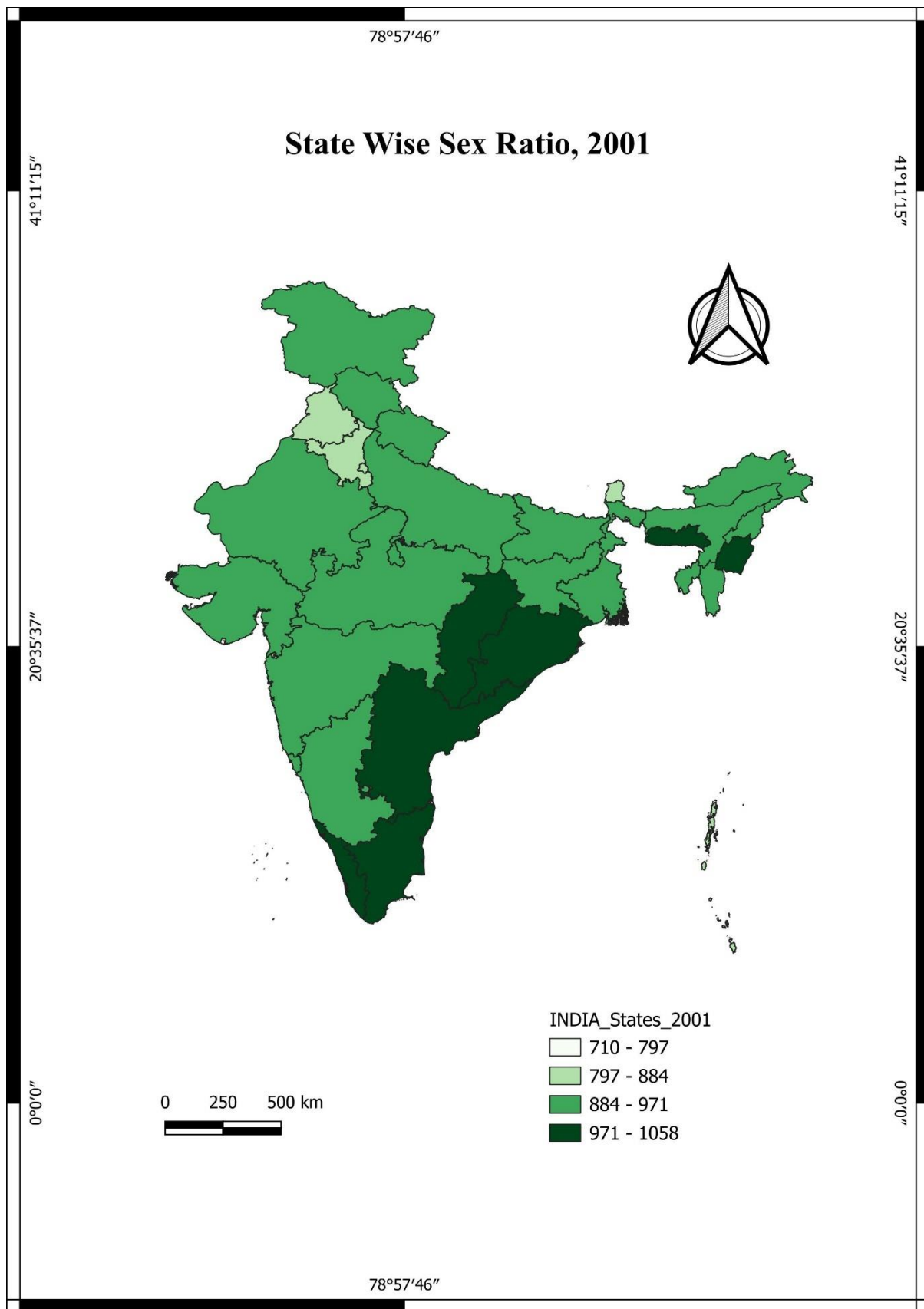


Fig5:State Wise Sex Ratio (2001), Source: Census of India, Office Registrar of India

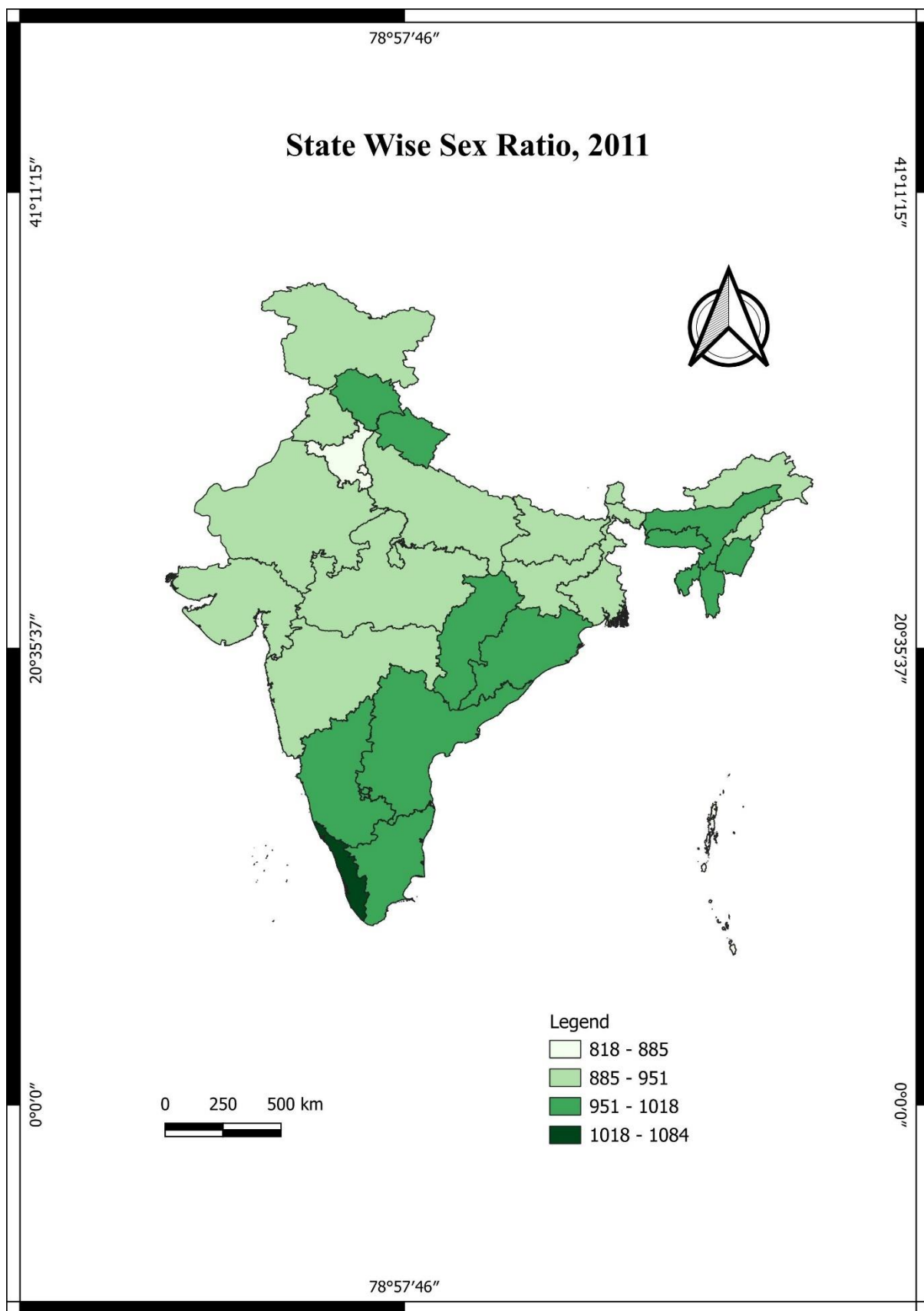


Fig6:State Wise Sex Ratio (2011), Source: Census of India, Office Registrar of India

While several regions still show a male-oriented sex ratio, the national data from 1961 to 2011 point towards an improved gender balance in India. In places where gender imbalances were once a striking feature of the demographic landscape, strategies aimed at enhancing the position of women in health, education and society seems to improve ratios. Such a dataset not only reveals the regionwise differences of India but also captures the long term effect of beneficial socioeconomic policies towards gender related problems.

Database and Methodology

This project was based upon Sex Ratio of States and Union Territories in India Which contain 28 states and 7 union territories. We got datas from Indian Census 1961, 1971, 1981, 1991, 2001, 2011. Which 6 datas over 50 years were combined and organized by Social Statistics Division, National Statistical Office, Ministry of Statistics and Programme Implementation, Govt. of India through publication of 23rd Issue “Women And Men In India 2021”. Were we collected map shape file from Diva-GIS. Also we used tool Quantum GIS for mapping of this data of Sex Ratio on shapefile. We used Equal Interval symbology for understating the different level of data in each states and union territories in each year.

Conclusion

This project presents a state-wise and decade-wise historical analysis of sex ratio in Indian states and union territories (UTs) from 1961 to 2011, revealing sharp regional differences and temporal trends. The results reflect that although certain regions still show a skewed sex ratio towards males, numerous states have developed positively over the decades. These changes could act as reflections of socioeconomic reforms, government mode of approaches and increasing gender equity consciousness.

This project highlights the success of measures like implemented strategies such as the PCPNDT Act, advances in health care, education and social awareness by mapping this data over time. But it also shows other places that may need more targeted interventions if we are to stay on a positive ways towards gender balance.

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