

Where angels fear to tread? Mapping women and men in India

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Abstract. The authors have produced the *Atlas of Women and Men in India*, using material from the 1991 Census, mainly at district level. The Atlas may be unacceptable to Indian geographers because it seeks to question the authority of numerical data and of maps, and to Western geographers because this is “mapping before we understand the process”. The authors introduce maps of the sex ratio in India and explore through a map of changes in the sex ratio 1981-91 some numerical, analytical, and ethical problems of such mapping. The Indian feminist activists consulted want the Atlas for advocacy: does this justify its production?

Introduction

Are the four of us (and our feminist publishers) angels or fools? Our *Atlas of Women and Men in India* (Raju et al, 1997) relies on census data, computer cartography, and geographical information systems (GIS) to display variety across 452 districts, mainly for 1991. (As no census was held in Jammu and Kashmir in 1991, not all districts could be included.) For the following reasons, our Atlas may, on the academic scene, at best attract a storm of protest and at worst disappear with a whimper:

- (1) In India many senior geographers, gripped by the promises of the quantitative revolution, demand objectivity, neutrality, and spatial analysis in the(ir) search for truth.
- (2) In the West, the multiple dangers of maps, statistics, and products of GIS such as this Atlas are at the forefront of many minds (Dunn et al, 1997).

We respect the dangers and have sought to outline them in the text of the Atlas. We have had to attempt a cross-cultural collaboration “in the boundary zone between positivist and critical paradigms, consciously combining critical theory, empirical (data), and quantitative and qualitative analysis” (Rocheleau, 1995, page 458). It is nevertheless only too possible that the Atlas may be doubly rejected: by many senior Indian geographers for our critical warnings about data, statistics, and maps, and by

many Western geographers for our promotion of quantitative description.

We wish to argue here that the dangers are real: that statistical maps can mislead and be misused, and that they can equally be unwisely rejected. To Western geographers, this is a past debate, but to many users of maps it remains a live issue. Statistical maps are, in Escobar's (1995) term "techno-representations" with a spurious authority; they can be a "new imperialist geography" (Taylor, 1990). The West has been all too successful, particularly in geography, in assimilating others to the view that GIS is an objective tool of applied science; we would see it rather as a social process (Sheppard, 1995) which imposes a quantitative rather than a qualitative view of space (Rose, 1993) and can lead to "the worst sort of positivism" (Smith, 1992). Attempting a critical use of GIS for a largely nonacademic audience has been a daunting task. We may hope to work passionately and sensitively (Madge, 1993) within the power relations existing between Indian and British academics on the one hand (Radcliffe, 1994) and between GIS and its subjects on the other, but "Every map presages some form of exploitation" (Hall, 1993, page 384), and "There are features of the use of these systems that are fundamentally undemocratic" (Curry, 1995, page 79). The possibility that the maps will still be used uncritically remains alarming.

Despite the extensive discussion in geography of feminism and quantification, the Atlas may be closed to many potential users who are feminist and/or poststructuralist. Will they see such a reduction of human life to numbers as admissible in 1997? Can it contribute in any way to the feminist search for a better world? From our own experience, we wonder! The use of statistical indicators by Townsend and Momsen (1987) in *Geography of Gender in the Third World* horrified Mohanty (1990): "The everyday, fluid, fundamentally historical and dynamic nature of the lives of third world women is here collapsed into a few frozen 'indicators' of their wellbeing" (page 6). When Townsend (1991) argued for atlases of gender, to support interpretative and critical research, one referee for *The Professional Geographer* argued that such an approach "negates the intra-cultural variability and plurality of gender relations ... To start regionalizing and mapping before we understand the process does the topic a disservice". A close friend of Townsend uses this same article in teaching, as a "fine example of unfeminist geography". Yet Indian feminists encouraged us to produce this Atlas, and contributed to its shape (see below). How far is such an alliance, between academics and activists, Indian and British geographers, more than a smokescreen (Goetz, 1991; Townsend et al, 1995)?

Why map women and men in India?

Between 35 and 90 million girls and women are estimated to be missing from the Indian population (Dreze and Sen, 1995). (South Asia, China, North Africa, and West Asia all have a 'shortage' of women and girls.) Nationally, the sex ratio in India

reached its lowest level ever recorded in 1991, at only 927 women and girls per 1000 men and boys (including estimates for Jammu and Kashmir), compared with some 1050:1000 in industrialised countries.¹ The state of Haryana, at 865:1000, has a smaller proportion of girls and women in its population than any state of comparable or larger population in the world. (Sex-selective migration has created highly masculine populations in small countries of the Gulf.) At 846 million in 1991 (including estimates for Jammu and Kashmir), India's was a very large and complex population concealing great social variety. The leading single mechanism in the shortage of women and girls is nevertheless thought to be the *neglect of girls, neglect so severe that more small girls die than small boys*. Among human beings, more males are conceived than females; in most countries, more males die than females at all ages from the moment of conception and females outnumber males in the population. In India in 1981, by age 1 more girls than boys had died in 133 out of 429 districts, and by age 5 in no less than 275 districts. (The figures for 1991 are not yet available.) Girls tend, especially when the family already includes one girl, to be breastfed for a shorter period, fed less well, and taken for fewer medical consultations than boys (for review and references, see Kishor, 1995). Although both female infanticide and the selective abortion of female foetuses are widespread, numbers are relatively small compared with the deaths of girls from neglect after the age of 1.

The pattern is strongly regional (figure 1; Agnihotri, 1996; Atkins et al, 1997). Girls and women are more scarce in large parts of north India and less scarce in the south. The relative position of states has not altered much since the turn of the century, but the area with 'missing women' is now bigger and more intense than in 1901, so that more and more states are becoming unusually short of women and girls. Simplistic explanations work well for maps at state level, but not at the more detailed district level (Harriss and Watson, 1987). It is at the district level that cultural differences across India can best be explored (Agnihotri, 1996).

The number of little girls as compared with the number of little boys (figure 2, see over) is a telling sign of the unequal treatment they receive. Sadly, in 1961 there were 976 girls for every 1000 boys under 7 in India, but in 1991 only 945. Oldenberg (1992) writes of a "Bermuda Triangle for the girl children" in parts of Haryana, Uttar Pradesh, Rajasthan, and Madhya Pradesh, like a pit with sloping sides. Regional contrasts in the survival of girls are strong, and clearly related to regional cultures. But how?

¹ The convention outside South Asia is to calculate the sex ratio in numbers of men per 1000 women.

Exploring one map

Here, we seek to explore from a single new map of changes in the sex ratio some debates on the use of such maps in demography and cultural geography. We shall discuss only the biggest changes, in case of any miscounting of girls and even women in the census. We shall refer to a reduction in the number of girls and women per 1000 boys and men of 20 or more as a definite ‘deterioration’, and an increase of 21 or above as an ‘improvement’.

Figure 3 is a map of change in the sex ratio (for all ages) for 429 districts of India between 1981 and 1991, again displaying clear regional patterns. (The number of districts is further reduced here by the lack of a census in Assam in 1981.) The map shows what the changes were, and where, tempting us to ask, why? how? and so what? What conclusions may be drawn, what policies proposed, what interpretations offered, what understandings reached? But the map is only a beginning. We shall show that

- (1) insufficient census data have yet been published even for numerical analysis, and
- (2) numerical analysis will inform further research rather than provide conclusions.

Table 1. Differential child mortality in 1981, by change in the sex ratio 1981–91, for 275 districts of India where more girls than boys had died before the age of 5 in 1982 (source: RGO, 1981; 1991).

Age ^a	Number of districts experiencing					
	deterioration ^b				improvement ^b	
	> 40	> 30	> 20	> 0	> 0	> 20
1	10	20	28	88	55	5
2	16	27	40	112	71	4
3	16	32	50	139	79	6
5	16	33	58	180	95	8

^a Age by which deaths of girls outnumbered deaths of boys.

^b Deterioration is defined as fewer females per 1000 males and improvement as more females per 1000 males.

The numbers game Of the 58 districts with deterioration, the majority are concentrated in the two states of Bihar and of (eastern) Uttar Pradesh. Bihar (-143) deteriorated more than any other large state in the period 1981-91 and has seen great change since 1901, when it entered the century with a sex ratio of 1054:1000. More positively, 23 districts recorded improvement: in tribal areas of the northeast and northwest, in the southwest, and in some metropolitan areas. But what were the components of these changes? All 58 deteriorating districts had higher death rates under age 5 in 1981 for girls than boys, and nationally deterioration in the period 1981 -91 correlated by district with a higher death rate of girls than boys under 5 in 1981 (see also table 1). But not everyone stays in their district: sex-selective migration as well as sex-selective mortality may contribute to a sex ratio, and

migration of men and boys to work is an important feature of Indian demography. (At the national level, migration would tend to improve India's sex ratio, because India's main net migration is of men to the Gulf and to Southeast Asia in search of work.) Figure 1 is not a map of changes in discrimination but is blurred by changing migration patterns.

Agnihotri (1996) has shown that analysis of the sex ratio among children eliminates the effects of migration, because there is almost no sex-selective migration by children. Unfortunately, only the 1981 data were available to him, and to us, at the necessary level of detail. The only sex-ratio information available for 1981 and 1991 and corrected for the 1991 map of districts is the overall sex ratio, with all its limitations.

A thorough statistical evaluation of the changes must therefore await the appearance of age-specific sex-ratio data so that the statistical effects of sex-differentiated child mortality can be separated from those of male labour migration. For instance, in Bihar and eastern Uttar Pradesh, the out-migration of men and boys for work used to be important, but declined greatly in the 1980s (Kundu and Sahu, 1991; Premi, 1991). Boys and men here probably contributed to the worsening of the sex ratio (figure 1) merely by staying at home. The deterioration is much less in Rajasthan, Madhya Pradesh, and Orissa, where the sex ratio has long been poor and discrimination against girls pronounced (Kumar, 1993), but male out-migration has not been high. Maharashtra, on the other hand, has received much in-migration, especially of men and boys. Only Greater Bombay, Nashik, and Amravati had any increase in the proportion of women and girls and most districts recorded a decline, while Raigarh, Bids and Osmanabad saw in the 1980s both an increase of 40% in their urban population and a deterioration of over 20 in the sex ratio.

Migration seems also to have a role in improvements in the sex ratio. In most districts of Punjab, Haryana, and western Uttar Pradesh, the proportion of women and girls in the population appeared to increase between 1981 and 1991. Here, very high 1970s in-migration of men and boys for the extra jobs created by the Green Revolution contributed to the poor sex ratio of 1981 but declined sharply in the 1980s. It is possible that small increases in the proportion of women and girls in metropolitan districts such as Bangalore, Bhopal, Greater Bombay, Calcutta, Delhi, Hyderabad, Lucknow, and Madras may reflect a reduction in the sex selectivity of migration to them. The sex ratio of cities of over 100000 (880:1000) in India remained in 1991 poorer than that of urban areas (894:1000), which again had a smaller proportion of girls and women than rural areas (938:1000), but the overall sex ratio of cities had improved slightly since 1981.

The southwest—as for so many social features in India—is different. The state of

Kerala (except Thrissur District) and most districts of southwest Karnataka show some increase in the proportion of women and girls. Here, the death rates of children and the sex ratios are comparable with those of Europe and North America, with more small boys dying than small girls; male-selective out-migration to the Persian Gulf has also been important. Districts in other parts of India with large tribal populations also have both a higher risk of death for boys than for girls and a larger proportion of girls and women, as in some districts of the northeast and the tribal districts of Madhya Pradesh.

Clearly, before the sex ratio and changes in it are used to explore discrimination, the data should first be corrected for migration and indeed the impact of ageing. Yet these are not simply numerical issues, but involve human values. The sex ratio in India could be equalised just as successfully by neglecting more boys as by caring better for girls, but that is obviously not an option.

Some associations are clear from the numerical data. There is at district level, for instance, “a positive link between economic affluence and gender inequality” (Murthi et al, 1995, page 776). Dreze and Sen (1995) attribute both this link and the shrinking presence of females in the Indian population through this century to an emulation of elite behaviour. That is, such discrimination against girls (and to a lesser degree women) had been characteristic of 'higher' castes for centuries. When there has been a reduction in poverty among the 'lower' castes, these people appear to have adopted more discrimination against girls. Unexpectedly to Westerners, *it is today in districts with less poverty, more urbanisation, better medical facilities, and greater male literacy that the risk of death tends to be higher for small girls than for small boys.*² (Male literacy is associated with a much greater decline in the deaths of small boys than those of small girls.) Conversely, fewer children die (particularly fewer girls) where there is greater female literacy and a higher admitted participation of women and girls in paid work (Dreze and Sen, 1995; Murthi et al, 1995; Raju and Bagchi, 1993). Murthi et al (1995) argue that these variables which favour the survival of girls are all directly related to women's agency; Dreze and Sen (1995) use the census to place women's agency at the centre of social progress in India: “social justice can be achieved only through the active agency of women” (page 178).

Beyond indicators

But these are associations. What are the processes and relationships? Large data sets are always better sources for patterns than for processes, and GIS still handles attributes far better than it handles relationships. The real questions all still remain to be answered. Does literacy enable women to keep more of their children alive and to

² This is a current correlation by Dreze and Sen (1995) of district data from 1991. In the 19th century, the incidence of poverty was probably low in Punjab and Haryana, high in Kerala.

neglect their daughters less, and does a recognition of their economic value assist? Or is it that, where girls and women are valued more, their literacy, economic participation, and survival are all promoted? Do similar groups of processes operate in different places, or among different social groups in the same place? Do 'regions' where there are particularly few women represent regions of similar processes? The very substantial literature analysing numerical data and direct investigations on the sex ratio in India still has no adequate answers.

Dreze and Sen conclude that there are features of Indian society which are simply not recorded in the census which play an important role in local sex ratios. In regression analysis, variables such as urbanisation, affluence, women's participation in paid work, and female literacy together 'account' to a degree for the survival chances of a baby girl, but so, over and above all of these together, does simply being born in the South of India.

The census is not designed to measure culture, but records some symptoms which raise vital questions in cultural geography. The new cultural geography has many tools for exploring the geographies behind changing sex ratios in India, from discourse to practice: we look forward to a better understanding, and we believe that "to start regionalizing and mapping before we understand the process" can, so long as the limitations of choropleth maps are understood, help direct research into the process. As nongeographers observe,

"The entire northern region is one where the agency of women has been comprehensively repressed, among Hindus as much as among Muslims or Sikhs, leading not only to a severe female disadvantage in child survival but also to the persistence of very high levels of mortality and fertility" (Dreze and Sen, 1995, page 177).

Where angels fear to tread?

Indian feminists and representatives of Indian nongovernmental organisations (NGOs) and government departments inspected our preliminary maps at a British Council workshop in New Delhi, in April 1995. The welcome they gave to these maps and their obvious excitement not only encouraged us to go ahead and produce the Atlas but did much to secure the funding for publication. On their advice, we incorporated not only the district-level maps we had drafted, but maps and tables of leading features at state level, "because planners and decisionmakers always think at state level", and prepared tables by districts of the main variables, "because people want to use the figures in campaigning". From their reactions and those of less senior NGO workers, we determined to design and write the Atlas for a wide public of activists and decision makers. The publication of all or part in Hindi and other Indian languages is under discussion.

Our leading interest is in the possible uses of the Atlas in the development of awareness and in rice-roots political action. Academics would rarely wish to identify particular districts out of 452: it is local activists above all who seek to set their own place in context. Our leading fear is of the dangers of alienating techno-representations, of the meretricious authority of the product of a computer (Dunn et al, 1997). Our goal has been to reduce that alienation and to enable the user to command and criticise the Atlas.

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References

- Agnihotri S, 1996, "Juvenile sex ratios in India: a disaggregated analysis" *Economic and Political Weekly* 28 December, 3369-3382
- Atkins P J, Townsend J G, Raju S, Kumar N, 1997, "A geography of the sex ratio in India" *Espace, Populations et Societes* in the press
- Curry M R, 1995, "GIS and the inevitability of ethical inconsistency", in *Ground Truth: The Social and Economic Implications of Geographical Information Systems* Ed. J Pickles (Guilford Press, New York) pp 68-87
- Dreze J, Sen A, 1995 *India: Economic Development and Social Opportunity* (Oxford University Press, Delhi)
- Dunn C, Atkins P J, Townsend J G, 1997, "GIS for development: a contradiction in terms?" *Area* 29 151 -159
- Escobar A, 1995 *Encountering Development: The Making and Unmaking of the Third World* (Princeton University Press, Princeton, NJ)
- Goetz A M, 1991, "Feminism and the claim to know: contradictions in feminist approaches to development", in *Gender and International Relations* Eds R Grant, K Newland (Open University Press, Milton Keynes) pp 133 -157
- Hall S S, 1993 *Mapping the Next Millennium: How Computer-driven Cartography is Revolutionizing the Face of Science* (Vintage Books, New York)
- Harriss B, Watson E, 1987, "The sex ratio in South Asia", in *Geography of Gender in the Third World* Eds J H Momsen, J G Townsend (Hutchinson, London) pp 85-115
- Kishor S, 1995, "Gender differentials in child mortality: a review of the evidence", in *Women's Health in India: Risk and Vulnerability* Eds M Das Gupta, L C Chen, T N Krishnan (Oxford University Press, Delhi) pp 19 - 54
- Kumar N, 1993, "Regional dimensions of the status of women in India" *Social Change* (New Delhi) 23(1) 20-29
- Kundu A, Sahu M K, 1991, "Variation in sex ratio: development implications" *Economic and Political Weekly* 26 2341 -2342
- Madge C, 1993, "Boundary disputes: comments on Sidaway (1992)" *Area* 25 294-299
- Mohanty C T, 1990, "Cartographies of struggle", in *Third World Women and the Politics of Feminism* Eds C T Mohanty, A Russo, L Torres (Indiana University Press, Bloomington, IN) pp 1-50
- Murthi M, Guio A-C, Dreze J, 1995, "Mortality, fertility and gender bias in India" *Population and Development Review* 21745 - 782
- Oldenberg P, 1992, "Sex ratio, son preference and violence in India" *Economic and Political Weekly* 5-12 December, page 2658
- Premi M K, 1991 *India's Population: Heading Towards a Billion* (BR Publishing Corporation, New Delhi)
- Raju S, Bagchi D (Eds), 1993 *Women and Work in South Asia: Regional Patterns and Perspectives* (Routledge, London)

- Raju S, Atkins P J, Kumar N, Townsend J G, 1997 *Atlas of Women and Men in India* (Kali for Women, New Delhi)
- Radcliffe S, 1994, "(Representing) post-colonial women: authority, difference and feminisms" *Area* 26 25-32
- RGO, 1981 *Census of India, 1981* (Registrar General's Office, New Delhi)
- RGO, 1991 *Census of India, 1991* (Registrar General's Office, New Delhi)
- Rocheleau D, 1995, "Maps, numbers, text and context: mixing methods in feminist political ecology" *The Professional Geographer* 47 458-466
- Rose G, 1993 *Feminism and Geography: The Limits of Geographical Knowledge* (Polity Press, Cambridge)
- Sheppard E, 1995, "GIS and society: towards a research agenda" *Cartography and Geographical Information Systems* 22 5 -16
- Smith N, 1992, "Real wars, theory wars" *Progress in Human Geography* 16 257-271
- Taylor P, 1990, "Editorial comment" *Political Geography Quarterly* 9 211 -212
- Townsend J G, 1991, "Towards a regional geography of gender?" *The Geographical Journal* **157(1)** 25-35
- Townsend J G, Momsen J H, 1987, "Towards a geography of gender in developing market economies", in *Geography of Gender in the Third World* Eds J H Momsen, J G Townsend (Hutchinson, London) pp 27-81
- Townsend J G, Arrevillaga U, Bain J, Cancino S, Frenk S F, Pacheco S, Perez E, 1995 *Women's Voices from the Rainforest* (Routledge, London)

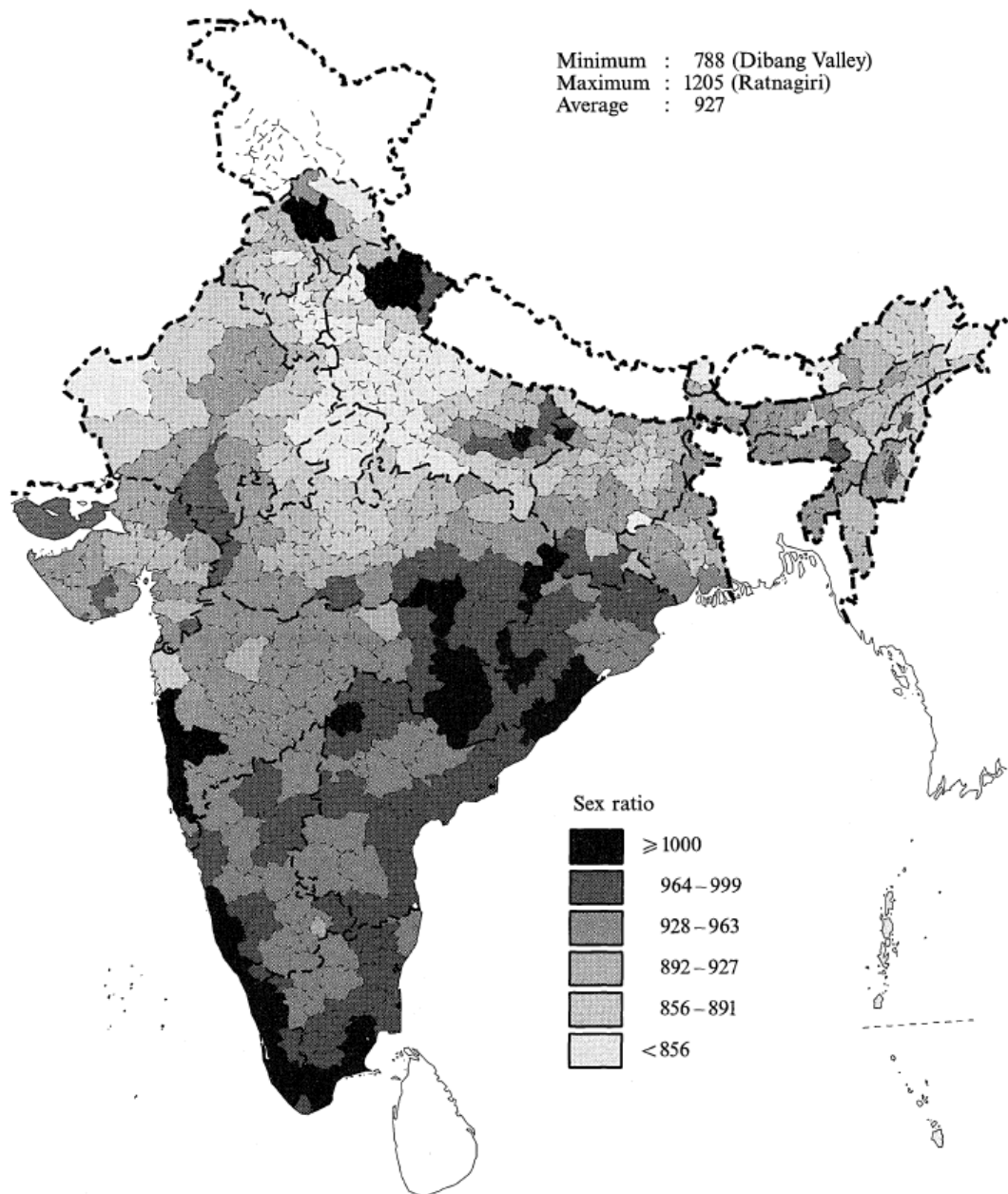


Figure 1. Number of girls and women for each 1000 boys and men in 1991 (source: RGO, 1991). No census was taken in Jammu and Kashmir in 1991.

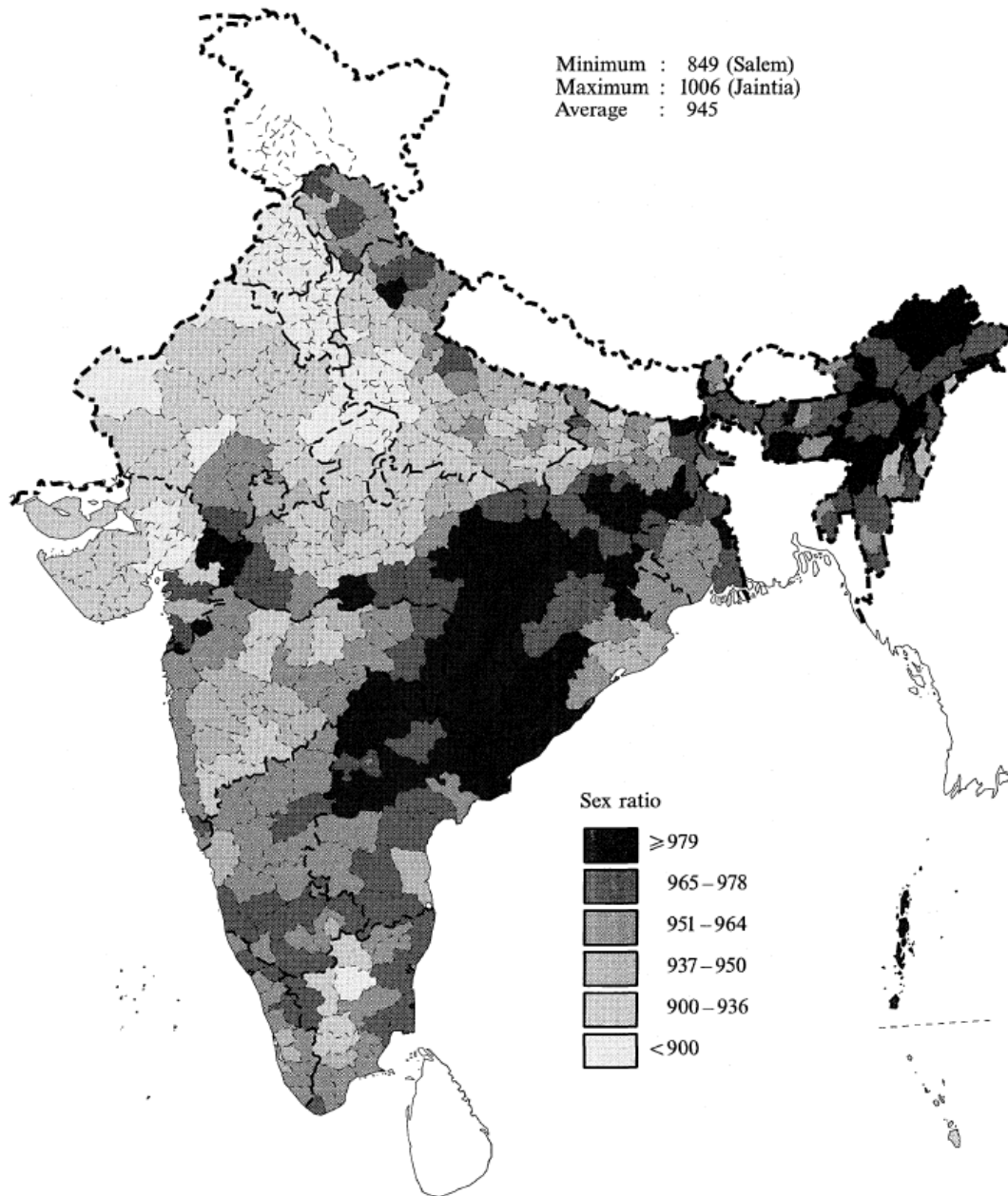


Figure 2. Number of girls per thousand boys in children under 7 years (source: RGO, 1991). No census was taken in Jammu and Kashmir in 1991.

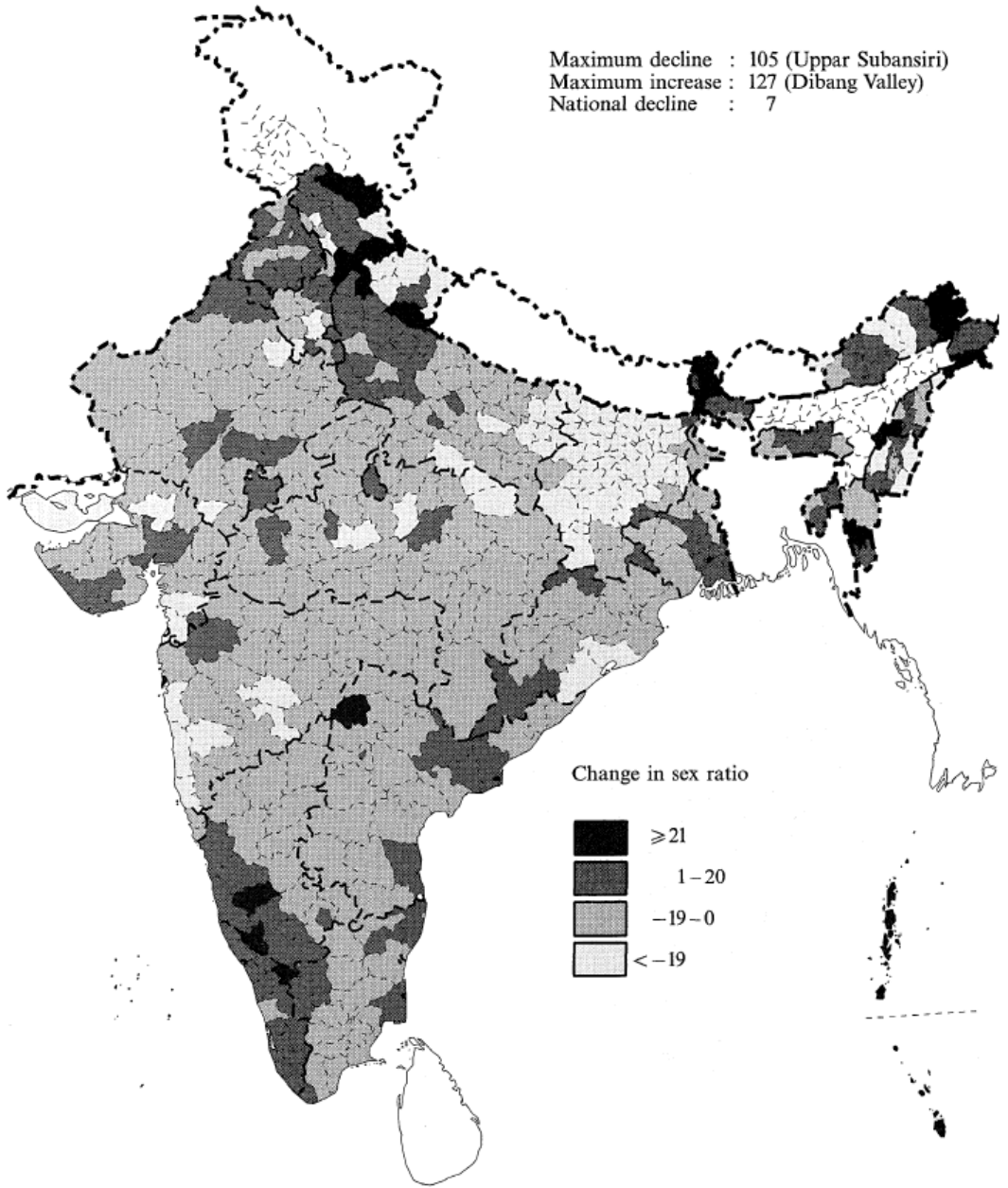


Figure 3. Change in the sex ratio, 1981-91 (source: RGO, 1981; 1991). No census was taken in Assam in 1981 and none in Jammu and Kashmir in 1991, so no comparison can be made for these areas.