

# POPULATION GEOGRAPHY

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# THE LINGUISTIC PATTERN OF HUNGARIAN POPULATION

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This study focuses on some aspects of the linguistic geography of Hungary. The country had a turbulent history. It was invaded by other countries for several centuries. The country became a melting pot for a wide range of different ethnic groups. It underwent frequent territorial changes. Hungary today is a small country having a relatively homogeneous ethnic composition. However, it shows several interesting peculiarities when examined in terms of its linguistic pattern. The main goal of the study is to reveal these peculiarities and to find explanations for the great territorial differences therein. Along with a universal use of Hungarian as the first language, an east-west, a core-periphery and a north-south dichotomy is observed in respect of the second language knowledge.

Hungary is situated in East-Central-Europe, its land area is 93.070 Sq.kms. It shares borders with Austria on its west, Slovakia on its North, Ukraine and Romania on its East, Serbia, Croatia and Slovenia on its South. Its population is 10,030,000 which shows a massive decrease every year. Hungary represents one of the oldest Christian state in its region, founded by settled nomadic tribes in the 10th century. Over the past 1100 years the country was ruled by several other nations out of which the longest was the Turkish rule which lasted over 150 years from the year 1526. Afterwards it went in the hands of Austro-Hungarian Empire, which lasted till World War I. After the war it lost its population and about two third of its land area. After World War II the Trianon Peace Treaty was finalised and in 1949 the country became the member of the Communist Block till 1990, and thus introduced the socialist system in the country.

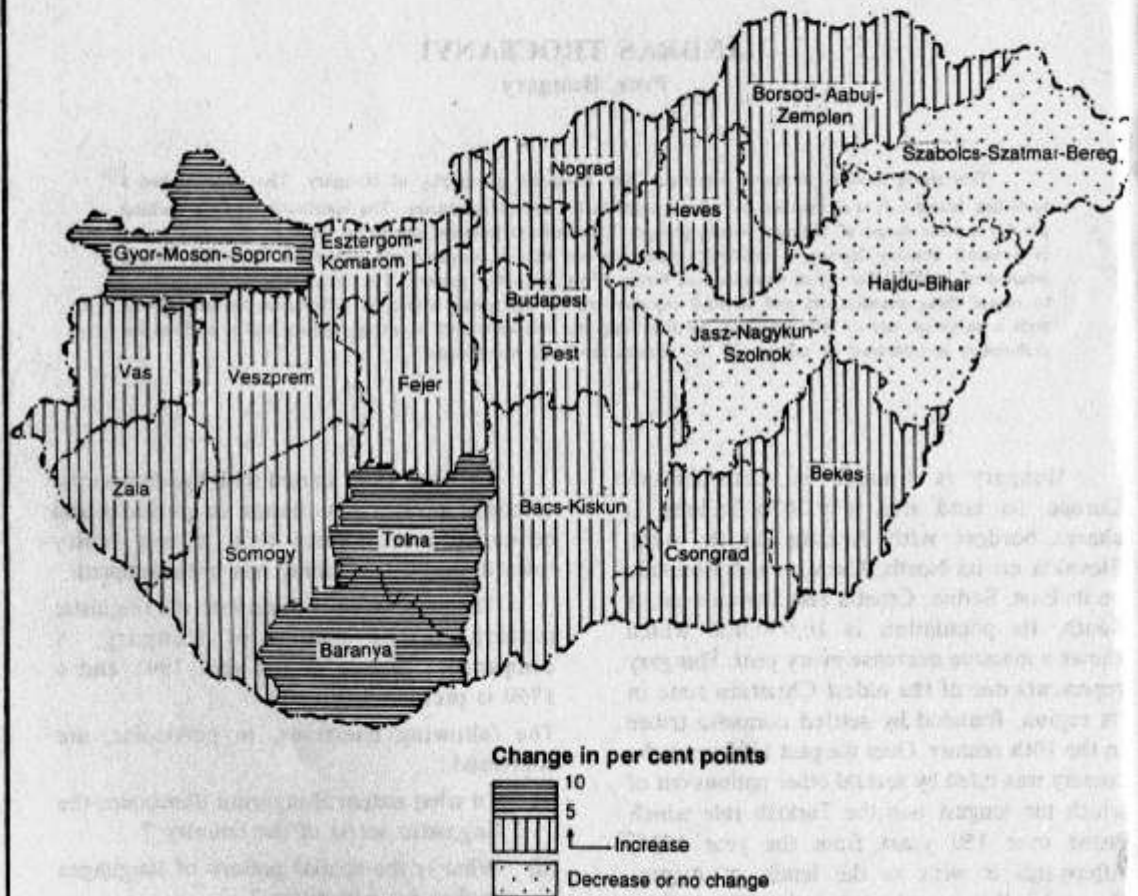
The year 1990 started with the democratic elections resulting a change in political and economic system. Since then a new policy towards market economy has been adopted.

The present paper deals with the linguistic pattern of the people of Hungary. A comparative picture of the year 1941 and a 1990 is presented (Fig. 1)

The following questions, in particular, are addressed :

- (i) To what extent Hungarian dominates the linguistic scene of the country ?
- (ii) What is the spatial pattern of languages spoken by minorities ?
- (iii) What is the regional pattern of foreign language knowledge spoken by minorities ?
- (iv) What is the relationship between the settlement structure and territorial division of foreign language knowledge ?

HUNGARY  
**Change in Percentage of  
 Hungarian Speaking Population  
 1941 - 90**



Note: 99.8 per cent of Hungary's population spoke Hungarian in 1990.  
 In no county this percentage was less than 99.

FIG.1

## Data Base

The period since 1990, in spite of the fact that, significant changes have happened in the past four years in every aspect of life, but, has not been able to change the language knowledge picture significantly. Some changes in the structure of language learning and education may become perceptible only in the figures of the 2000 National Census.

The results of the 1941 National Census, which were taken into consideration, shows us language knowledge picture existing half a century ago. It may be noted that as a result of 1938 and 1940 Vienna Decision, South Slovakia, the Southern parts of Carpathian Lowlands, Northern and Eastern Transylvania become parts of Hungary again. This caused a tremendous amount of migration within and across the new boundaries of the country. However, after World War II, the political map was redesigned, giving it a smaller size as of today. The 1941 data in the present paper covers the present territorial limits of the country, not that it actually had in 1941.

As in the case of every study of this nature, the present exercise is without its limitations. We have to handle the question of language knowledge with exceptionism, because the data are based on self declaration. In each of them extremity is present; a postman living in a minority-village does not consider his German language skill-which is essential for his daily work-language knowledge, while a clerk working in a town office, having a beginner level language exam, getting extra payment for it, regards hers as language knowledge. In general, due to the law of big numbers these extremities are equalized and the figures as a whole represent a fairly reliable picture.

Altogether 23 languages are included in the figures of the National Census. During the examination, three categories emerge: (i) mainstream language, (ii) minority languages, and (iii) foreign languages. Mainstream language is Hungarian. It is the official language of the country. Minority languages are the ones which, different ethnic groups living in a vast territorial

spread speak. They are historically part of the nation, although they arrived at different periods of history. The biggest minority group is the German, who were invited to the country as agricultural laborers in the 18th and 19th century. Besides, Gipsy, Rumanian, Slovak, Slovenian, Croatian, Serb and Slovenian population groups are scattered over different parts of the country. Hungarian is the second language of these people. Moreover a section of Hungarian speaking population has acquired the knowledge of several foreign languages, such as German, Russian and English. This renders further variety to the linguistic picture of the country (Fig. 2,3 and 4).

Accordingly, the present paper is structured into three sections: (i) Hungarian language knowledge, (ii) Languages of the minorities, and (iii) knowledge of foreign languages. It may be noted here that the German language enjoys a special position. It is both a minority and a foreign language. Thanks to the high cultural level and the beneficial help from Germany, this minority has preserved its language better than several other minorities in Hungary.

## Hungarian Language Knowledge

The knowledge of Hungarian language-as we would think-is essential for Hungarian citizens in everyday life. It is spoken by 97.6% Hungarian population as mother tongue. For the minorities it is the second language. One of the best ways of learning a second language is to spend much time in the host environment. So from this point of view, the minorities had this advantage. In spite of this, 20,216 Hungarian citizens, equal to the whole population of Mohacs-size town did not know the official language of the country. If we have a look at the same figures of 1941, we have to immediately realize that because of the higher rate of minorities at that time, only 98.1% of the population spoke the Hungarian language, which meant 173,000 persons-a population of a present Pecs-size city-did not speak Hungarian at all. Of course, these people did not live in big cities but mainly, in those counties which can be characterized by small village settlement structure in remote national-minority communities.

## HUNGARY: Patterns of Second Language Knowledge, 1990

FIG. 2

### GERMAN

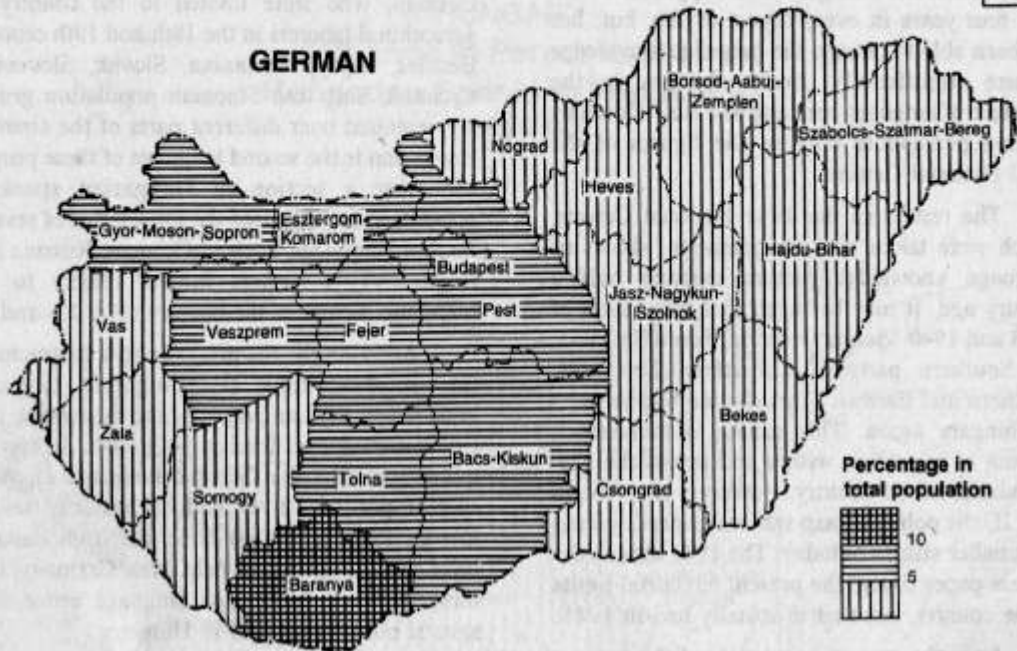


FIG. 3

### RUSSIAN



Table 1  
Hungary : Hungarian Language  
Knowledge 1941 and 1990

Country/County	Percentage in Total Population	
	1941	1990
Hungary	98.1	99.8
Baranya	90.6	99.5
Bacs-Kiskun	97.6	99.8
Bekes	98.2	99.5
Borsod	99.7	99.8
Csongrad	99.4	99.8
Fejer	98.2	99.8
Gyor-Moson-Sopraon	93.5	99.8
Hajdu-Bihar	99.8	99.8
Heves	99.7	99.8
Jazs-Nagykun-Szolnok	99.8	99.8
Komarom-Esztergom	97.1	99.6
Nograd	99.1	99.7
Pest	97.8	99.8
Somogy	99.0	99.7
Szabolcs-Szatmar-Bereg	99.8	99.9
Tolna	90.5	99.8
Vas	97.1	99.8
Veszprem	98.3	98.8
Zala	99.1	99.8
Budapest	99.2	99.7

While examining the territorial distribution of people, not speaking Hungarian, it is striking that, Bekes and Baranya counties have outstanding figures as related to the country average. This can be explained by the presence of a large number of minorities, German, Slovak, Croatian and Rumanian here in the case of Komarom-Esztergom county, the presence of the Slovak Minority and in Szabolcs-Szatmar-Bereg county that of Rumanian refugees, explain the relatively high rate of those who cannot speak Hungarian. This rate is further strengthened by the presence of Gipsy minorities. Gyor-Moson-Sopron county is also marked by a relatively low rate of Hungarian speaking population. This can be explained by the presence of Austrian and German speaking population, who settled here long ago. In the high society circles they need not know the Hungarian language because the people

around them, as we will see later, had the highest rate of German language.

Table 2  
Hungary : Second Language  
Knowledge 1941 and 1990

Country/County	Percentage in Total Population	
	1941	1990
Baranya	33.17	17.59
Bacs-Kiskun	13.92	7.06
Bekes	22.99	10.89
Borsod	6.10	4.20
Csongrad	6.33	6.63
Fejer	11.07	6.35
Gyor-Moson-Sopraon	14.50	8.29
Hajdu-Bihar	3.72	5.05
Heves	3.24	4.12
Jazs-Nagykun-Szolnok	2.00	3.12
Komarom-Esztergom	22.34	9.94
Nograd	11.01	5.98
Pest	20.29	8.15
Somogy	10.30	8.02
Szabolcs-Szatmar-Bereg	3.32	3.13
Tolna	23.74	9.77
Vas	9.80	8.38
Veszprem	13.72	7.20
Zala	6.86	8.13
Budapest	25.64	16.75

In the case of Tolna county, the percentage of Hungarian speaking population increased from 90.5 in 1940 to 99.8 in 1990. This enormous change was the result of deportation of Non-Hungarian speaking German population after World War II. The deportation was explained by the false theory of 'collective guilt', meaning participation in Fascist politics. Studying the Hungarian language knowledge from a settlement hierarchical point of view, it is observed that the county capitals has got the highest rate with 99.9 per cent followed by other towns and Budapest. Villages specially small one (under one thousand habitants) are characterized by lower figures, thanks to their isolation preserved minority composition.

### Language of the Minorities

(i) German Language Knowledge shows a dual nature in Hungary. On the one hand, it is

on the top among the Non-Hungarian languages in the country. On the other hand, the number of persons with the German language knowledge showed a decrease by 30 per cent during 1941-1991. In all, there are 400,000 persons with the knowledge of this language. The territorial picture of German language knowledge is mainly determined by the distributional pattern of German minority of 30,000 in all. They speak that language as mother tongue influencing the Hungarian population of their places of living. This is well illustrated by the Baryana county. Here German minority live in the settlements situated along the border of Tolna and Baryana counties. The high values of Budapest can be explained by the relative concentration of the German people by the Buda-Side agglomeration. Specially high rate of German speaking population in Győr-Moson-Sopron and Komárom is in correlation with their location along the historical Vienna to Budapest, which axis along with the East-West dichotomy can be clearly seen, with relative concentration of German knowing population in the counties adjoining Austria.

The values of 1941 are numerically 30 per cent bigger than the 1990's, which is explained by the 10 times bigger (300,000) minority population, too. We also have to consider while examining the 1941 datum that in a German-oriented political and social system it was not a disadvantage to admit German nationality. At that time the country average was higher, the influence of the minorities on the Hungarian population was more determining and significant and the East-West dichotomy could be seen more clearly. The outstanding figures of Baranya, Tolna counties and Budapest are supported by the presence of minorities as well, while the high values along the Budapest-Vienna(Berlin) spatial structure line can be explained by the German orientation. The East-West dichotomy was supported more by the peripheral position of East, showing a 30-times differences in comparison to the figures of the West. Analysing the main differences between 1941 and 1990 it can be seen that the regional differences became smaller, which is the result of the bigger rate of

German language speaking population. Comparing the 55 per cent decreases in the number of German speaking population to the 90 per cent decrease in the number of the minority it is evident that the number of those who speak German as a foreign language increased at a significant rate.

Table 3

**Hungary: Composition of Second Language Knowledge 1941 and 1990**

Language	Percentage in persons knowing second language	
	1941	1990
1. German (M+F)	60.57	35.10
2. English (F)	2.98	17.76
3. Russian (F)	0.85	12.19
4. Gipsy (M)	1.61	5.49
5. Slovak (M)	15.46	5.33
6. French (F)	4.20	4.12
7. Roumanian (M)	4.09	3.82
8. Croatian (M)	4.96	2.78
9. Serb (M)	1.49	1.28
10. Italian (F)	1.27	1.27
11. Polish (F)	0.86	0.75
12. Spanish (F)	0.10	0.63
13. Czech (F)	0.66	0.34
14. Slovenian (M)	0.41	0.32
15. Semitic (F)	N	0.24
16. Bulgarian (F)	0.29	0.23
17. Greek (M+F)	N	0.22
18. Esperanto (F)	N	0.16
19. Finnish (F)	N	N
20. Macedonian (M+F)	N	N
21. Japanese (F)	N	N
22. Chinese (F)	N	N
23. African Languages	N	N

M = Minority Language F = Foreign Language  
N = Negligible

Since the 1990 National Census, the German orientation has increased in Hungary again, which thanks to Germany and Austria who had promoted German language knowledge. Besides, the new political orientation of Hungary has linked it more to the German speaking countries. The economic, commercial and tourism connections

make German language knowledge indispensable for those who take part in these.

#### (ii) Gipsy language knowledge

The knowledge of Gipsy language is next to that to that of German, as a minority category. Gipsies make the biggest minority in our country, 143,000 persons, but the number of Gipsy knowing population is only 71,000. The language assimilation of this ethnic group is evident.

The territorial distribution of the gipsy speaking population is the same as that of this ethnic group. In Transdanubia more specifically in Somogy, Baranya, Zala and Tolna counties and in Great Hungarian Plain, particularly in Szabolcs-Szatmar-Bereg and Nograd counties, the rate of Gipsy language knowledge is relatively high along the Vienna-Budapest structure line, the Gipsy knowing population is small (Fig. 5).

Examining all this in the framework of settlement hierarchical picture, it is learnt that the Gipsy language is spoken at a higher rate in villages and suburbs. The number of the gipsy population increased from 27,000 to 170,000, or by 530 per cent during 1941-1990. At the same time the number of Gipsy knowing population increased at a smaller rate by 250 per cent. This signifies a high rate of language assimilation of this group. Language assimilation is facilitated by the low level of education of the concerned group. The Gipsy language-teacher training also does not exist.

Above all, the Gipsy ethnic group in Hungary is not homogeneous at all. They originated from the same homeland but arrived in different waves. On their way to Hungary, they melted into other ethnic groups losing their clear identity. That is why the structure of their language is different within. Some of them speak a Hungarian-Roumanian mixture, some of other kind. All this weakens the status of their language.

#### (iii) Slovak language knowledge

The knowledge of Slovak language was clearly linked to minority territories in 1990. A relatively higher rate in this regard is observed in the counties along the Slovaks border. The

reason for the outstanding value of Bekes is that from the total Slovak population of 10,000 33 per cent lives there. The remaining 66 per cent is spread in a settlement band North-West of Budapest in Pilis Hills, and in the small villages of Zemplen Hills. In other parts of the country, the rate of Slovak speaking population is very low. The 1941 picture was only different when Csongrad and Bacs-Kiskun also had significant Slovak speaking population at that time. The language assimilation was the strongest here. The "habitancy change" (deportation) also affected this area most drastically from the language point of view, as well.

#### (iv) Other minority language knowledge

Besides, Rumanian, Croatian, Serb and Slovenian languages are spoken only in ethnic localities. The knowledge of Rumanian language is noted in the counties adjoining Rumania. Among the 10,000 Rumanians, 5,000 live in Bekes county. Since the late 1980's Rumanian refugees have arrived in an increasing number. They are either Transylvanian Hungarians or Rumanians. They have brought along their Rumanian language skills.

Similarly, the knowledge of Croatian language is also linked to the territorial location of the 13,000 Croatian people. It is striking that while the number of Croatians is higher than that of the Rumanians, the number of Croatian knowing people is lower. The Croatian minority lives in a relatively big concentrations in parts of Baranya, Vas and Zala counties. In some settlements they make 50 to 70 per cent of the total population.

The Serb knowing population's territorial location is related mainly to distribution of nearly 3,000 Serbians. Baranyes, due to the Serbian minority settled in its Southern parts, Bacs-Kiskun because of the Serbian settlements along the river Danube, and Csongrad because of the Serbians living in the Tiszan-Maros corner show higher rates of Serb knowing population. The speed of language assimilation in their case is higher than the minority assimilation. The number of Serbian population decreased by 20 per cent while that of



### HUNGARY: Patterns of Second Language Knowledge, 1990

FIG. 4

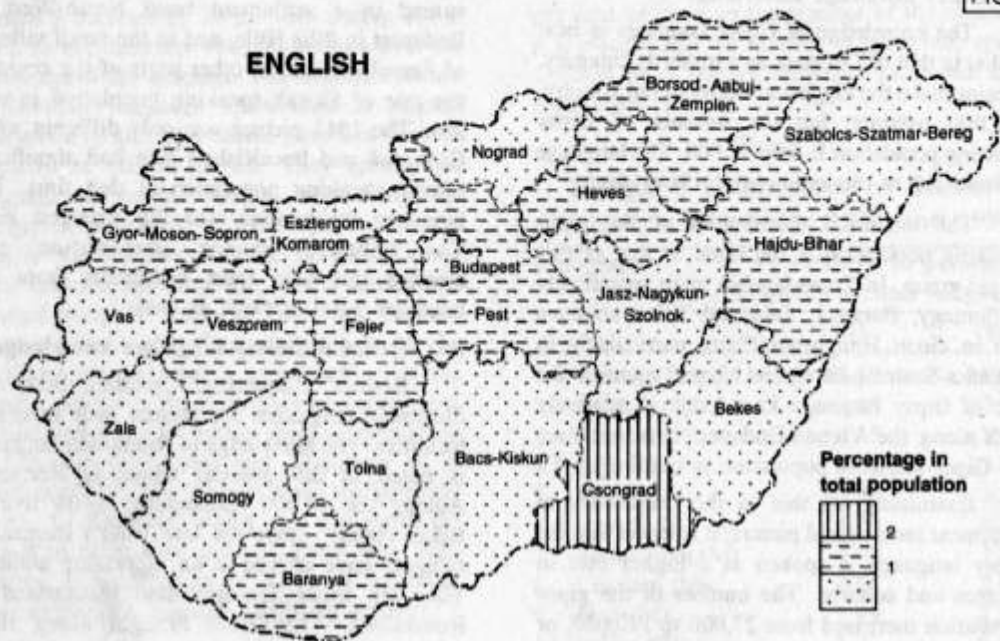


FIG. 5



the Serb knowing people by 40 per cent.

In 1990, about 2,000 Slovenians lived in the country in a relatively high territorial concentration in Vas county. The language assimilation of this population group is high. The Slovenians decreased in their number by 7 per cent during 1941-90, the number of Slovenian knowing people decreased by 40 per cent. This represents a very strong language assimilation.

It follows that there is a high incidence of language assimilation of minorities, such as Gipsy, Slovak, Serbian and Slovenian in Hungary. German language is in a special position. It has preserved its significance as a minority language and is very popular today as a foreign language. This process is supported by the historical, political and cultural traditions. Its present position can be 'challenged' only by the English language in the coming decades.

### Knowledge of Foreign Languages

The languages learnt belong to another category, here minority background is not involved. The most preferred foreign language, as inferred from their acquisition-rate in Hungary were English, Russian, French, Italian and Spanish. Among these languages, only English and Russian are more popular minority languages, except German, while French has the 6th, Italian the 10th and Spanish the 12th place in the list of languages in Hungary.

#### (i) English language knowledge

English language is the most popular foreign language in Hungary. The situation was not the same in the past, when French ranked higher in the 1960's. Of the country's total population, 2.21 per cent know English, 99.8 per cent of them as a foreign language. It is a four fold increase since 1941.

The territorial picture of the English speaking population shows us an interesting picture. Budapest, as the capital of the country, has an English speaking rate which is three times the national average. Csongrad county comes next. This is explained by the presence of Szeged which is a cultural and educational centre. On the other hand, in the agricultural counties of

Somogy, Vas and Zala, the percentage of English knowing population is low. In Tolna, the high rate of minorities and the rural features, in Nograd the industrial, while in Szabolcs-Szatmar-Bereg, the agricultural peripheral position account for the low values for English speaking population.

The role of English language is rapidly gaining importance in whole world. This is more due to the influence of the USA rather than of Great Britain. Today English is the medium of the international communication in political, cultural, economic and scientific life.

#### (ii) Russian language knowledge

The knowledge of Russian shows a relatively homogeneous picture in the whole country. From 1947 to 1990 the Russian language was compulsory from the fifth form of elementary school to university studies. Its priority, rooted in the political compulsion that time, is not as strong at present. This is the result of the attitude of everyday people towards Russian language learning, as obligatory things always provoke a strong resistance. The absolute number of Russian speaking people is only two-thirds of the English and one-third of the German speaking population. Comparing the 1990 figures with the 1941, the increase is 1,000 per cent. It moved up from the 10th to the 3rd place in the rank order.

The territorial picture is almost homogeneous, though significant differences persist. Budapest has a high figure again, due to its central functions. The good position of Baranya, Csongrad and Hajdu-Bihar counties can be explained by the percentage of universities and numerous secondary schools. The group of counties, situated along the industrial or energy axis of the country, where the former Soviet Union-oriented heavy industrial factories and mines needed Russian speaking people, also have a large number of Russian knowing persons. The low figures for Gyor-Moson-Sopron county is the result of the traditionally West-oriented social composition of population (Fig. 3).

#### (iii) French language knowledge

The French language, with the sixth position on the country's list, has been a great loser in Hungary. German and English became more

popular languages mainly at the cost of French. During 1941-90, the number of French speaking population decreased by 33 per cent. In 1990, French was spoken by 0.5 per cent of the total habitancy with sharp territorial differences. The relatively high figures of Budapest, Baranya and Csongrad counties are explained by the presence of cities with universities and several educational institutions. Pest county, as an agglomeration zone of Budapest and as a residential area for the workers commuting to the capital, also has a high figure for French language knowledge.

#### (iv) Knowledge of other foreign languages

As Hungary has opened up foreigners have arrived and settled down in our country making the linguistic picture more colourful. Directly or indirectly, they take part in the language education of the Hungarians. That is why, the number of 'exotic' language- (Arabic, Hindi, Japanese, Chinese) speaking population in Hungary today is considerable. People living and settling down here consciously or spontaneously influence the habitancy in a positive way in their surroundings.

It follows that, during 1941-90, the number of French and Italian speaking population decreased while that of English, Russian, Spanish and Esperanto increased significantly. These changes can be well explained by the changes in the language education structure. For centuries Latin, then the languages of the neighbouring nations and still later the German determined our language educational structure. In the beginning of the present century German language learning was compulsory. In the early decades of this century, the second compulsory languages in schools were mainly French, English, Italian and Spanish. In the second part of the century, German and gradually English become the most popular ones. Now Russian is not compulsory any more. English and German have replaced Russian. French has appeared again in the group of popular languages. In the present educational structure, English stands in the first place having a bit higher popularity than German, then French, Russian, Italian and Latin in that order.

The settlement hierarchical picture of the foreign languages presents an interesting picture. Budapest accounts for 57 per cent of the foreign language speaking population, while its share in the total population is only 19.45 per cent. This capital city is outstanding in this regard. It is also noted that less a language is popular the more of its speakers of Budapest are concentrated in villages. The county capitals and emlvicisty towns have also high figures. Going down in the settlement hierarchy, the rate of languages learnt decreases. At the town level, the rate of foreign language speaking population is equal to the national average. The picture in villages is different. Minority languages replace learnt languages. There are, however, several settlements in Hungary where no foreign language is spoken.

### Conclusion

The linguistic geography of Hungary displays three broad features: (i) dominance of Hungarian almost every where, (ii) distribution of minority languages, such as German, Gipsy and Slovak, in the peripheral regions, and (iii) scattering of learnt foreign languages such as English, French and Russian, in country/county capitals and educational centers. This pattern is rooted in the changes in the boundaries and political orientation of the country. It is to be noted that, the foreign language knowledge is determined by the distribution of the ethnic groups. On the other hand, learnt languages are linked to bigger cities as well as regional, educational or tourism centres. Overlapping is found in those cases when these categories are present simultaneously. Baranya, Csongrad, Bekes, and Pest counties and Budapest, as the national capital, represents this situation.

One can observe the traditional regional dichotomies in the linguistic pattern of Hungary. The East-West duality in the case of learnt languages, with prominence of the west in this regard. The North-South duality is also present. Minority groups and associated minority language knowledge is more typical of the southern counties. The centre-periphery dichotomy is the sharpest in the country. Budapest has outstanding figures in almost all languages.

# SETTLEMENT NETWORK DEVELOPMENT POLICY AND URBANISATION IN HUNGARY IN THE 20TH CENTURY

ZOLTAN HAJDU

Pecs, Hungary

The paper brings out the role of political economy in influencing the process of urbanisation and structure of settlement network. This is demonstrated through an empirical study of Hungary during the twentieth century. Three phases get easily distinguished: pre-1949 or the period of changes in the state boundaries; 1949-89 or the period of state socialism; and post-1989 or the period of institutional reform. An interesting finding is that there was a bias in favour of large cities and county seats in allocation of development funds under all the regimes.

The macro regional, territorial, demographic and settlement structure of Hungary has gone through radical changes several times during the 20th century. In the first half of the century the main reasons were the state structure connected to the two world wars and the changes of the state borders, while during 1949-1989 it was the values and the functioning of the economic, social and political system of the state socialism that were dominant.

The process of the territorial concentration of the population accelerated from the beginning of the century, due to the strong development of the capitalist economy. The process of achieving city status was linked with the tendencies of the concentration of the population of the settlements, although it was far from being consequent.

City status in the feudal era was a privilege, the ruler donated the title of free royal town providing the opportunity for inner-self governments, also the possibility of representation in the feudal national assembly.

The control of the sphere and legal status of the municipal towns, together with the promotion of some towns, remained the authority of the legislation in the period of the civil public administration. In the frameworks of the state socialism the legal status of the towns and their relationship to the regional administration was reorganised several times. In the new local government system created in 1990, the reevaluation of the Hungarian past and the efforts to assert the principles of the European Charter on Local Governments appeared simultaneously, if we look at local-regional administration. The local governments of the settlements were evaluated as never before in the history of the Hungarian public administration.

The settlement network development policy of the state socialism was determined to a great extent by the long-term, planned, ideal notion of society as well as by the direct conception of society and the actual practice of the organisation of society.

## City status in the Hungarian civil administration

The legal regulation of the modern Hungarian urban administration goes back to the 1848, the time of the Civil Revolution. Its basic elements were stated in the early 1870s, and its continuity of right remained until 1949, although with amendments in many aspects.

In 1848 the free royal towns with privileges of feudal origin were divided into three categories based on their population (small towns with less than 12 thousand inhabitants, medium towns with 12-30 thousand population and large towns with more than 30 thousand inhabitants). The inner structures of the towns were formed according to the categories.

In 1870 the free royal towns were defined as municipalities, together with the counties and other administrative-historical units with feudal regional autonomy. Municipal rights meant that the town practised all local government functions, it intermediated the state administration. Also, it could deal with matters of public and national interest, directly state its opinion to the government, it could have direct initiatives to the Parliament. In the definition of the legal status the only aspect was the privilege obtained in the history, not the population or the level of functional development. (Among the municipal towns there were ones with less than two thousand and others with more than 50 thousand inhabitants, as well).

In 1871 the village act defined three settlement types: corporate town, large village and small village. The act said that all areas and inhabitants of Hungary had to belong to a village. The village act linked the legal status of the settlements not with their population but with their economic strength.

The corporate towns achieved relatively wide administrative self governments. It had the right of independent decision in its own affairs, it executed its decisions by its own

elected leaders and organs. The elected body had control over the common property, had the right to levy taxes, was responsible for the roads belonging exclusively to the settlement, schools, also for fire service, public order and for the poor. The local government supervised the local market places, the field, mountain- and market order, the construction and health care activities. It was responsible for the orphans and the court of guardians, controlled local industrial and agricultural labour matters.

The legal status of the capital city, Budapest, was regulated by a separate act in 1872, authorising the city with the widest local government authorities. The state paid special attention to the development of Budapest: they intended to make it competitive with the capital city of the Austro-Hungarian Monarchy, Vienna.

In the creation of the modern public administration three categories were established: capital city, municipal town and corporate town. No uniform urban act was passed, and the criteria of the different types of towns were not specifically regulated. The declaration of a municipal town was the authority of the Parliament, the promotion to a corporate town was to be considered and decided upon by the minister of home affairs.

The number of population was again in the foreground at the decrease of the number of municipal towns in 1876. The legislation decided that all municipal towns the population of which did not reach 12 thousand people (the limit for the small towns in the 1848 act) should be deprived of the municipal status. The act eliminated the privileged status of 47 towns. The bigger part of the towns transformed into corporate towns, a smaller part into large villages. (The universal declaration of all the towns with more than 12 thousand inhabitants as municipal towns was not a matter of discussion, not even in the case of those towns the population of which significantly exceeded 12 thousand.)

In 1886, 1929 and 1945 major corrections were made in the system of local governments. These modifications can be evaluated as the delimitation of the local government administration and as gradual nationalisation.

### Changing state borders in the first half of the 20th century

If we examine the 1918-1947 processes, we have to draw attention to the problems of the notions "current" and "flashed back" in Hungarian regional researches. The actual historical processes took place according to the current regulation, within the current state borders. On the other hand, we cannot deny the appropriateness of the analyses flashed back, related to the state borders after 1947. The analysis connected to the current conditions leads to historically relevant, while the analysis of the flashed back structures to rather statistically relevant results.

The first half of the 20th century can be defined as the period of the changes of the state borders in the Hungarian history (Table 1). Till 1918 Hungary had been a member state of the multi-national Austro-Hungarian Monarchy. Apart from the person of the ruler, foreign affairs, military affairs and the financial affairs to cover the costs of these, Hungary had a total inner autonomy.

After being defeated in World War I, the Austro-Hungarian Monarchy was

eliminated by the decisions of the great powers and the efforts for independence by the ethnic minorities from inside. Hungary recovered its total national sovereignty, too, but in a way that the size of the Hungarian state, the number of its population and settlements, within that the number of towns, decreased to a large extent. One third of the Hungarians remained outside the new state borders.

In the time of the census of 1920, 3243 of the 3468 settlements at that time (93.5%) had less than 5 thousand inhabitants. 130 (3.8%) had populations from 5 to 10 thousand and 95 (2.7%) had more than 10 thousand citizens. On the other hand, only 48.5% of the Hungarian population lived in settlements with less than 5 thousand dwellers, while 11.2% in settlements with 5 to 10 thousand, 40.3% in settlements with less than 10 thousand inhabitants.

There was not a mechanical connection between the population category and administrative status of the settlements. In 1920, 1.54 million inhabitants (19.3%) lived in municipal towns, 0.94 million people (11.7%) in corporate towns, 0.75 million persons (9.4%) in villages, with more than 10 thousand people.

With the changes of the borders before and during World War II it was mainly the Hungarian-populated regions that were given

Table 1

#### Hungary : Territory, Population and Towns and Urbanisation Level, 1910-1947

Year	Territory (km <sup>2</sup> )	Population	Number of towns	Percentage of urban population
1910	325411	20886487	161	18.9
1920	93073	7990202	47	32.7
1930	93073	8688319	56	33.2
1938	105000	10382014	58	-
1939	117061	11076036	64	-
1940	160165	13653296	86	-
1941	171640	14683323	91	28.8
1947	93011	9316613	59	-

back to the authority of the Hungarian state. Nevertheless, the state with the new area proved to be an ephemeral one, meaning a framework for co-existence for a few years, only. In the period of the census of 1941, in the area under Hungarian sovereignty there were 6668 villages and towns. The population of 6258 villages did not reach 5 thousand; 234 had 5 to 10 thousand inhabitants. The population of 176 settlements exceeded 10 thousand people, within this, four had more than 100 thousand and 1 more 1 million persons. In the time of the census, 1164588 people (7.9%) lived in Budapest, 1366234 persons (9.3%) in municipal towns and 1703441 inhabitants (11.6%) in corporate town. 1355710 inhabitants (9.2%) lived in 95 villages with more than 10 thousand people. Not all the corporate towns had more than 10 thousand citizens.

After being defeated again in World War II, the Peace Treaty of Paris in 1947 annihilated the territorial increases before and during the world war, in addition, it annexed three villages to Czechoslovakia.

### **Urbanisation processes and settlement network development in the period of state socialism (1949-1989)**

In the period of the census of 1949, out of 9207033 population of Hungary, 1058288 people (11.5%) lived in Budapest, 858119 inhabitants (9.3%) in the other 13 municipal towns and 1263711 persons (13.7%) in the 46 corporate towns. The total number of the urban population was 3180187, making 34.5% of the country's population. The 61 villages with more than 10 thousand inhabitants had 863969 dwellers, making a kind of transitory phase between the villages and the legally acknowledged towns. Statistics and settlements science considered these villages as potential towns. The majority of the population of Hungary, 5162886 people, lived in villages with less than 10 thousand inhabitants.

The 1949 constitution, the 1950

administrative reform and the Act I. on the Councils institutionalised the communist arrangement in Hungary. In the new political and administrative structure the administrative status and the situation of the towns was essentially rearranged. During the administrative reform of 1950 the number of the towns decreased significantly, since 7 suburbs surrounding Budapest were administratively united with the capital city (Fig. 1).

Towns were put into three categories: Town directly under the Council of the Ministers (Budapest); towns directly under the county councils (24) and towns under the district councils (29).

#### **1. Regulation of the legal status of the towns and the criteria of the declaration as a town.**

In the period of the state socialism the historical traditions of the Hungarian urban administration were abandoned in many respects. Only the capital city of the country was made equal to the county level of the regional administration, the other big and important towns were ordained under the authority of the county councils, the smaller ones under the authority of the district councils.

In the history of the Hungarian public administration, in the period until 1954 regional control dominated over towns, both at county and district levels. In the council system created after the Soviet example, all elements of the system of local self governments disappeared, the town councils became executive type organs of the central power. In the real management the county and town party committees were dominant.

The Act II on the Councils in 1954 partly returned to the historical traditions of the Hungarian public administration inasmuch as the four most populated and functionally most developed towns (Debrecen, Miskolc, Pecs, Szeged) were taken out from the authority of the counties and were declared as towns with

county rank, equal to the counties. The other towns, uniformly as towns with district rank, were placed under the control of the county councils.

The Act III on the Councils "brought back" some historically developed elements of the system of local governments into the Hungarian public administration. The Act eliminated the category of town with county rank, and put back the big towns as county towns into the counties, at the same time it maintained the separation of their support from the state budget. Győr was added to the county towns. The minimum population of the county towns was defined at 100 thousand inhabitants, in order to achieve this, several villages around Győr were administratively united with the town.

The situation of the towns with district rank changed inasmuch as the district ceased to be a council administrative level, thus the "district rank" lost its meaning. Following the Act on the Councils, then, the three categories of the towns became the capital city, county town and town.

For the first time in the history of the Hungarian urban administration, the government defined the criteria of the declaration of a town in 1974. The legislation contained both a demographic minimum and some requirements related to central roles, provisional attraction zones and the level of development of the infrastructure in the settlement. A village could be declared a town if its population reached 8 thousand people.

Besides the minimal number of population it was also defined that for the city status the settlement had to have an established system of central roles: The trading, administrative, secondary education institutions of the settlement had to serve at least 30 thousand people. The settlement applying for the city title should have an infrastructural provision much more developed than the village level.

The criteria of the declaration as a town were reregulated in 1983, mainly starting from an administrative political aspect. The most important change was that the minimal number of population was no longer a requirement, the declaration of the applying village as a town "takes place after a comprehensive individual measurement taking into consideration its own socio-economic development and its provisional, economic and administrative functions that also serve its surroundings as well as the regional endowments". The legislation specifically stated that "... some outstanding villages with special roles can become towns without attraction zone functions". From the aspect of the city status one of the conditions of the regulation was a turning point: "The fact of the declaration as a town cannot go together with grants from the central budget". This decision eliminated one of the basic values of the urban policy of the state socialism, namely the conscious financial support of urbanisation.

## 2. The process of urbanisation in 1950-1990

In the era of the state socialism there was

Table 2

### Hungary: Population, Number of Towns and Urbanisation Level, 1949-1980

Year	Population	Number of towns	Percentage of urban population
1949	9207033	60	34.5
1950	9207033	54	34.5
1960	9976530	63	39.7
1970	10315597	73	44.5
1980	10709536	96	53.2
1990	10375323	116	61.8



## HUNGARY: Distribution of Urban Places

FIG. 1



FIG. 2



a significant growth in the number of the towns and their population, also, their regional distribution changed (Fig. 1 & 2, Table 2). The process of the urbanisation did not take place at the same pace, if we look at the period as a whole, and, due to the changes of the criteria of the declaration as a town, the size of the population and the functional content of the town as such basically changed, too.

In the 1950s mainly the new, industrial type "socialist towns": Dunaujvaros, Varpalota, Komlo, Kazincbarcika, Oroszlany and Ajka were formed, at the same time Torokszenmiklos as an agrarian centre and some traditional central places such as Keszthely and Tata achieved city status.

In the first half of the 1960s the declarations paused, then in the second half they strengthened. The major part of the settlements declared as towns was small towns, developed in functional sense (Godollo, Szarvas, Szigetvar, Tapolca, Sarospatak, Sarvar, Siofok, Kapuvar, Mateszalka) and Tiszaszederkeny as a socialist industrial town (then in 1970 Leninvaros, now Tiszaujvaros).

The urbanisation of the 1970s was characterised by the adjustment to the expectations of the National Concept for the Development of the Settlement Network and to the system of requirements of the declaration as a town, approved in 1974. During this decade 23 villages obtained city status. Most of the settlements declared as towns had more than 8 thousand inhabitants, but in a number of cases the declaration could only take place after some of the surrounding villages were administratively annexed to the would-be town.

The 1980s can be characterised by an urbanisation process following the "decrease" of the system of criteria of the declaration as a town. In this decade 70 settlements obtained city status, more than in any period before. Because of the elimination of the minimal population, the inner structure of the size distribution of the towns basically changed.

In 1990 the population of 42 towns did not reach 10 thousand, among them 5 did not even have 5 thousand inhabitants.

### 3. Settlement network development policy

The evolution and growth of the settlement development policy of state socialism was greatly influenced by the conception of society in the new system. Settlement development had to be integrated with the centralised structure of public administration and planning.

In 1951 the Supreme Economic Council prescribed the classification of towns and communities into categories from the aspects of city planning and development in the period of the First Five-Year Plan. It was the first document of the socialist settlement network development policy.

The categorisation of the settlements outgrew the original destination (orientation of the industrial and communal investments) and in a short time it transformed into a settlement and settlement network development conception, with the basic elements of the new regional and settlement development policy outlined.

In 1963 a new Settlement Network Development Study Project was published (Fig. 8) which was a kind of a compromise summarising the political, planning and scientific endeavours of the early 1960s. A basic element of this endeavour was constituted by the building up of 9 regional centres. With regard to the other towns the needs and possibilities of an organic, proportional but not too rapid growth was aimed at. (It was just a study plan, but published by the members of the Ministry of Town Development, but it functionated as "official" in the everyday practice).

In 1969 the National Settlement Network Development Framework Plan (not a decision) gave a comprehensive and detailed analysis of Hungary's spatial structure and the regional structure of the settlement network as well as



that of the development having taken place in the period of the state socialism. The Plan formulated the long-range functional categories of the towns and the urban communities of the country as well as the consequences of the individual categories from the aspects of development (Fig. 4).

In 1971 the National Settlement Network Development Conception—as an act—determined the range and directions of the development of national, special high-grade, high-grade, partially high-grade, intermediate-grade, partially intermediate-grade centres, the long-range number of inhabitants, the direction of development, the relationships between centre and gravity zone.

As a result of the economic crisis unfolding in the late 1970s, the restriction of the resources to be spent on settlement development, the modification of the Conception took place.

The parliamentary resolution of 1985 can be regarded as the final chapter of regional and settlement development policy of state socialism. In the resolution the alleged values of socialist society were still present, but there appeared the basic elements of a more open development policy and practice, differing from the earlier practice by reckoning with possible uncertainties, too, and acknowledging also the differences of the social interests on the regional and settlement level. In 1985 the hierarchical structure of settlement development disappeared.

### The 1990 reform of the local governments

The transition of the power, politics, economy and administration in 1989/1990 basically rearranged the former structures. During the "institutional systemic change" all elements of the political system, including public administration, were amended in the form of agreements.

In 1990 the distribution of the Hungarian settlements by size and the distribution of the population living in the different settlement categories were distorted in many respects

(Table 3). The reason why it is important to be aware of this is that the new act on local governments created a special numerology, it linked the different administrative organisational solutions with the population of the settlement categories.

Table 3

### Hungary: Distribution of Urban and Rural Population by Size Category of Settlements, 1990

#### A. Towns

Population size group	Number of towns	Percentage in urban population
Less than 9999	41	4.6
10000-19999	64	14.4
20000-49999	40	18.5
50000-79999	11	10.9
80000-119999	4	6.4
120000-219999	5	13.8
Budapest	1	31.4
<b>TOTAL</b>	<b>166</b>	<b>100.0</b>

#### B. Villages

Population size group	Number of towns	Percentage in urban population
-499	947	6.7
500-999	716	13.2
1000-1999	644	23.3
2000-4999	484	36.3
5000-9999	91	15.1
10000-	16	5.3
<b>TOTAL</b>	<b>2898</b>	<b>100.0</b>

The new act on local governments brought the most essential change by basically rearranging the division of labour and importance of the local and regional administration. Its basic principle is the evaluation of the settlement self governments. All subordinate relationships between the self-governments of the settlement were eliminated, in fact, even between the

settlements and the counties a co-ordinate, partnership connection was created.

With respect to urban administration, the act on local governments again introduced the notion of town with county rank and universally declared all the towns the population of which exceeded 50 thousand inhabitants as ones with county rank. Since this "county rank" means less than ever before, this promotion has rather ceremonial character and value, only, although it is of historical importance in the lives of some towns (Dunaujvaros, Nagykanizsa), since they were for the first time taken out from the authority of the county.

In the settlements with more than 10 thousand inhabitants the mayor was elected by the body of representatives, in the settlements with less than this number the citizens directly elected their mayor. Depending on the decision of the body of representatives, in villages with less than 5 thousand people the mayor could exercise his office in the form of social commission. Urbanisation continued in the new situation, too, towns with smaller and smaller population were formed.

By the end 1995 the number of the towns has gone to exactly 200, parallel to this the average population of the towns decreased considerably. Of course this decrease is also due to the fact that the decline in the population of Hungary reached the majority of the towns, too, and there is a natural decrease in the number of their inhabitants.

Among the new towns, the dis-union of two towns that had been created by former expectations, and their formation into separate towns has a special character and importance. By the administrative unification of Balatonboglár and Balatonlelle villages, in order to reach the minimum number of population necessary for the city status, Boglárlelle had been created. The united settlement achieved city status but the two parts were not able to and did not want to integrate. Using the possibilities offered by the systemic change, the two former villages of the town disintegrated and made two separate towns in 1991.

The same happened in the case of Hajdúhadház and Tégla. The two villages had been united and declared as a town under the name of Hadházteglas. In 1991 they disintegrated and both parts formed a separate town.

If we look at the regional and size distribution of the 200 towns of Hungary (Fig. 3), we can see that there is not one part of Hungary where towns are absent, but the towns got "shaken apart" in size and functional respect.

### Summary

Looking at the whole of the 20th century, there was a kind of discrepancy between the settlement that could be considered as towns in the functional sense and the ones legally declared as towns. In the beginning of the period legal towns only made a part of the settlements that could be seen as towns in the functional sense. Later, with the requalification of the population and content requirements of the "town as such", city status got further and further away from the functional towns.

In the time of the civil socio-economic formation (till 1949) towns developed mainly on their own financial bases, compared to which state developments were only of complementary character. City status meant, in the first place, a higher level of autonomy both for the municipal and later the corporate towns and still later for the towns with county rank. The maintenance of the wider autonomy required higher taxes and financial contribution of the citizens of the towns. In the time of the state socialism, city status did not mean an increased burden for the urban population, in fact, just the other way round, it went together with the acquisition of a bigger share from the state resources.

The settlement network development policy of state socialism went through a change in a form organically interlinked with the given political, economic and social objectives. Looking at the whole period we can speak

about some continuity in the sense that from first to last the direct decisive role of the communist party and politics was asserted in regional and settlement development.

In the allocation of the development resources nearly continuously preferences can be observed for the large cities and county

seats. The real losers of the settlement network development policy and practice were the majority of the villages.

In the new system, city status has no real financial advantage, but it does not burden the urban population with extra financial responsibilities, either.

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# A TYPOLOGY OF MIGRATION IN CANADA BASED ON MIGRANTS' CHARACTERISTICS

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Data from the 1981 Census of Canada are used to develop a typology of migrants on the basis of their personal characteristics. Migrants are defined as those individuals who have changed their residence since the 1976 Census, crossing at least a municipal boundary. Socio-economic and demographic characteristics are perceived to differentiate stayers from movers, and to distinguish each migrant type intraprovincial, interprovincial and international. Discriminant analysis is applied to classify people into migrant types based on their personal characteristics and the typology developed.

## Introduction

There have been previous attempts to conceptualize migration within a typological framework. While each of the former endeavours has contributed to the overall ordering of conceptual types, the various approaches have been unique, each emphasizing a different aspect of the phenomenon. Unlike fertility and mortality, migration cannot be analyzed in terms of physiological and/or non-cultural factors only, but must be differentiated with respect to social, economic and personal factors. It is, therefore, understandable that all aspects of this complex process have yet to be addressed in the construction of a comprehensive typology. One important migration component, not considered in previous typology building, is the personal characteristics of the individual migrant.

Among the earlier examples, the renowned typology developed by Petersen (1958, 1975) is universal in nature and a basic step toward formulating a general theory of migration. Both internal and international migration are

analyzed. The typology builds upon Fairchild's schema (1925) which implies that man is sedentary until he is impelled to move by some force. In Petersen's view, migration may be innovative- that is, some people migrate as a means of achieving the new, or it may be conservative-meaning some move in response to changing conditions in an attempt to retain the status quo. The consequences of migration are considered innovative or conservative in terms of the situation defined by either the individual or the activating agency. In other words, it is not possible to determine for whom the move is innovative or conservative, be it the individual or the agency; nor is it possible to analyze the motive of individuals as distinct determinants of why people move.

Krishnan and Odynak (1986) extend Petersen's schema into a typology that considers only the migrant (excluding the agency or equivalent), and two points in time (at least) rather than just one time point (time of arrival, or time of migration). Employing Petersen's migratory forces, the focus here is on how the migrant evaluates his/her position at the place of destination at time two-that is,



whether his/her socio-economic status has gone up, remained the same, or has gone down (the latter aspect is not considered by Petersen). While this typology takes into account both the causes and consequences of migration with respect to the migrant, the personal characteristics of the individual are still not an issue.

Beaman and D'Arcy (1980) consider various aspects of mobility and migration in their mover-stayer typology. They hold that mobility and migration cannot be analyzed by a single measure; rather several dimensions are required including: repeat migration, return migration, population turnover, long-term stability, and population growth. In another sense, however, their approach is more restrictive than the former two in that only internal movement is portrayed as defined by Canadian data. Again, personal characteristics are not a consideration.

Lee's (1966) migration theory, more or less, summarizes the basic concepts for consideration in the construction of typologies. He identifies four aspects of the migration process: factors associated with the area of origin, factors associated with the area of destination, intervening obstacles and finally, the personal factors which have received little emphasis in earlier typology building. The importance of personal factors is also pointed out by Goldscheider (1971). He suggests that the motivation behind the decision to move must be inferred from migration selectivity or, in other words, from the personal characteristics of movers. The present study focusses on this aspect. In the following sections, a typology of internal migrants by their personal characteristics is developed for Canada. The results are applicable to other countries as well, *mutatis mutandis*.

### Data and their Limitations

The data employed in constructing the typology are obtained from the individual file of the 1981 Census of Canada Public Use Sample Tapes. A one percent sample of

respondents was drawn for Canada. This provided a sample of 4,740 respondents.

The Census of Canada defines movers as those individuals who change their place of residence from the dwelling in which they lived five years prior to the census, and migrants as those individuals who cross at least a municipal boundary in the process of changing residence. Non-movers are defined as those who occupy the same dwelling as they did five years prior to the census. The Public Use Sample Tapes provide information on individuals with respect to the typew of movement including moves to another dwelling within the same municipality, another municipality within same province, another province in Canada, and from another country into Canada. There are limitations in the change of residence data, however, in that they do not capture information on those who made multiple moves over the five year intercensal period, on those who moved and returned between censuses, nor on those who moved and died between censuses.

The characteristics selected from the Public Use Sample Tapes which are theorized to characterize intramunicipal movers and migrants are the following: age, sex, marital status, presence and age characteristics of children at home, highest level of schooling, religion, ethnic origin, home language (language spoken most often at home), labour force activity, occupation and income. It is acknowledged that limitations exist in these census data in that they represent the characteristics of individuals at the time of the census but not necessarily the characteristics possessed over the previous five years or, more specifically, at the time of the move. For example, the number of children at home reported in the census need not be the same as the number present over the previous five years, or when the decision to move was made. Similarly, information on the other selected characteristics is based on the status reported in the 1981 census and does not pertain to the period five years prior to the census.

## Methodology

The selected personal characteristics are first cross classified with the various types of movement. Discriminant analysis technique is then used to classify individuals into non-mover (or stayer), short-distance mover, or migrant categories based on the personal characteristics possessed. The stayer and mover categories are defined as follows: stayers are persons who, on census day, were living in the same dwelling they occupied five years earlier, and movers are persons who, on census day, were living in a different dwelling than the one they occupied five years earlier. Among the movers, the categories are defined as follows: 1) intramunicipal or short distance movers are persons who were living in the same municipality but a different dwelling than five years earlier; 2) intraprovincial migrants are those living in the same province but a different municipality than five years earlier; 3) interprovincial migrants are persons living in a different province than five years

earlier; and, 4) international migrants are persons who were living outside Canada five years earlier.

The "group" variable in the discriminant analysis is mobility which consists of the five categories noted above (one of which is non-mover). The "discriminating" variables are the personal characteristics noted earlier-age, sex, marital status, presence of children, highest level of schooling, religion, ethnic origin, home language, labour force activity, occupation and income. Discriminant analysis classifies the individual groups by means of the characteristics. A set of classification coefficients is produced for each group. The equation for the *i*th group is:

$$C_i = c_{i1}V_1 + c_{i2}V_2 + \dots + c_{ip}V_p + c_{io}$$

where  $C_i$  = the classification score of group *i*;  
 $c_{ij}$  = the classification coefficient of the *j*th variable ( $j=1, n-p$ )  
 $V_j$  = the discriminating variable ( $j = 1, 2, \dots, p$ );  
 $c_{io}$  = the constant.

Table 1  
Mobility Status by Age

Mobility Status		Age					(Percent)
		15-24	25-34	35-44	45-64	65+	
Stayers	Female	19.7	12.6	15.3	33.8	18.6	52.5
	Males	26.8	9.8	14.5	33.1	15.8	53.6
Movers							
Intramunicipal	Female	25.2	29.0	19.2	17.5	9.1	25.2
	Males	22.5	39.1	16.4	16.4	5.6	22.6
Migrants							
Intraprovincial	Female	31.8	28.5	17.2	15.3	7.3	15.3
	Males	23.6	39.1	14.5	16.3	6.5	15.8
Interprovincial	Female	38.0	31.6	17.7	7.6	5.1	4.4
	Males	34.0	32.0	19.0	13.0	2.0	5.5
International	Female	29.8	19.1	21.3	21.3	8.5	2.6
	Males	29.8	31.9	27.7	8.5	2.1	2.6
TOTAL	Female	24.0	20.2	16.8	25.4	13.6	100.0
	Males	25.8	22.8	15.5	24.9	11.0	100.0

Note: All tables in this paper are based on the Census of Canada, 1981. Public Use Sample Tapes.

Details on the discriminant function technique can be seen in the SPSS manual (1975).

### Constructing the Typology

Of the ten discriminating variables entered in the analysis, the variable religion was rejected and six variables revealed statistically significant values. The most discriminating variable is age (having the greatest power to distinguish between groups as shown by the greatest change in RAO'S V). Following in order of importance are marital status, highest level of schooling, home language, income and presence of children. The remaining three variables-ethnic origin, labour force status and occupation-are not statistically significant but are nevertheless included in the classification (Table 8).

The characteristics of individuals are discussed below with respect to the appropriate groups (stayer, short distance mover, or migrant) to which they are classified. In this discussion, information is drawn from the cross tabulations (Table 1-7) and the classification table (Table 8).

### Stayers

Previous research reveals that the stage of life cycle strongly affects the decision of a person to move, or not to move. In this study,

54% of those sampled are stayers. The crosstabulations of mobility with age indicate that the largest proportion of stayers, both male and female, are aged 45-65; males and females aged 25-34 are the least likely to be stayers (Table 1). Over one half of the total sample is married and, of the stayers, the greatest proportion (49%) is married. Widowed persons are also likely to be stayers while those separated or divorced are more likely to be movers (Table 2). As the presence of children is theorized to suppress movement, it is not able that 57% of the individuals sampled has no children at home and only 8% has children under age 5 (Table 3). This may account for the somewhat smaller proportion of stayers among the younger married group.

Discriminant analysis reveals that age and marital status have the greatest power to discriminate between stayers and movers; the classification coefficients for these characteristics are shown to be highest in the stayer category. Labour force participation, over the long term, is also theorized to suppress mobility and this attribute also scores highest for stayers.

### Intramunicipal (Short Distance) Movers

The greatest amount of movement of any type can be attributed to short distance moves

Table 2  
Mobility Status by Marital Status

Mobility Status	Marital Status					Total
	Single	Married	Separated	Divorced	Widowed	
Stayers	41.9	49.3	1.6	1.1	6.1	53.2
Movers						
Intramunicipal	37.2	52.1	2.6	3.5	4.6	23.6
Migrants						
Intraprovincial	35.1	57.3	1.9	1.5	4.2	15.8
Interprovincial	50.9	42.2	3.2	2.3	1.4	5.0
International	34.6	52.9	1.9	4.8	5.8	2.4
TOTAL	40.0	51.0	2.0	1.9	5.2	100.0

(Percent)

from one residence to another within the same municipality. About one half of the moves made by respondents in this sample are of the intramunicipal type.

The stage of life cycle again plays a major role. Individuals who are between the ages of 25 and 34 years, married and with no children present represent the majority of the short distance movers. On the other hand, 43% of the respondents have children at home and the highest percentage of children present (22%) is shown for those with children age 6-14 years (Tables 1,2 and 3). It could, therefore, be concluded that the latter moves from one dwelling to another within the same municipality represent moves to fulfill expanding family requirements.

While the crosstabulations for this sample reveal the above noted characteristics for intramunicipal movers, the classification coefficient for age ranks in third place and the marital status and presence of children coefficients are down to fourth place; these variables are more discriminating with respect to stayers and longer-distance movers which show the highest scores. On the other hand, the income coefficient is highest for the intramunicipal group. Compared to other types of movers, the proportions of intramunicipal movers are spread more evenly over the income

categories with higher proportions falling in the higher income groups. This indicates that moves from one area to another within the same municipality are made regardless of income level, or that income is a lesser constraining factor in short distance moves than in moves of longer distances.

### Migrants :

#### Intraprovincial, Interprovincial and International

The personal characteristics that influence or retard migration may be viewed as two main types—those that are more or less constant throughout the life of an individual, such as intelligence, and those that occur at various stages in the life cycle. As noted among stayers, there may be ties or responsibilities at the place of origin in certain stages of life, such as raising a family or completing one's education, that are clearly important enough to limit migration. On the other hand, there may be changes, or sharp breaks, in one's life cycle which facilitate migration, such as the cessation of education or the dissolution of marriage through either separation, divorce or the death of a spouse. Consequently, even those individuals possessing what may be termed the constant characteristics theorized to influence migration are subject to the life

Table 3  
Mobility Status by Presence of Children (Percent)

Mobility Status	Percentage with Children Present				Total
	No Children	Children Age 0-5	Children Age 6-14	Children Age 15+	
Stayers	58.4	2.8	20.6	18.2	52.6
Movers					
Intramunicipal	55.8	13.8	22.2	8.2	25.2
Migrants					
Intraprovincial	55.6	14.1	22.6	7.8	15.1
Interprovincial	59.5	15.2	20.3	5.1	4.4
International	46.8	6.4	27.7	19.1	2.6
<b>TOTAL</b>	<b>57.1</b>	<b>7.9</b>	<b>21.5</b>	<b>13.6</b>	<b>100.0</b>

cycle stages that facilitate or restrain migration.

The personal characteristics show some similarities among the intraprovincial, interprovincial and international migrants; however, predominance or differences in characteristics are generally revealed for the international group. The statistically significant characteristics of the three migrant groups are outlined below.

**Age:** The crosstabulations reveal that, for all three migrant groups, individuals age 15-24 and age 25-34 have the greatest propensity to migrate. Migration then declines gradually for the intraprovincial and interprovincial groups. The international migrants diverge from this pattern somewhat in that the percentage of moves remains relatively high up to the 35-44 age group (and 45-64 age group for females), then declines sharply. The classification coefficient for age differentiates international migrants from the other two types and shows the highest

more than half of the migrants is married. The marital status coefficient distinguishes the international group with the highest score (Tables 2 & 8).

**Presence of children:** More than half of the intraprovincial and interprovincial migrants have no children at home and less than 8% has older children (age 15+) at home. This pattern is not so clear for the international migrants. Forty-seven percent of this group has children age 6-15+ at home and the classification coefficient for presence of children is clearly highest for the international group. It would appear that when the decision is made to migrate a long distance, perhaps to greater social and economic opportunities, the presence of children is no longer considered an important obstacle to migration (Tables 3 and 8).

**Home language:** Language differences, however, are considered important (and perhaps

#### Scores on Characteristics

Type of Move	Age	Marital Status	Children Present	Home Language	Educational Level	Income
Stayers	H	H	H	L	L	L
All Movers Migrants	L	L	L	H	H	H
Intraprov.	L	L	L	L	L	H
Interprov.	L	L	L	L	L	H
Internat.	H	H	H	H	H	L

classification score, ranking second highest after non-movers. (Tables 1 and 8).

**Marital Status:** With the bulk of the sample being married, the majority of migrants is married, however, the probability of being married varies with the distance of the move. In moves of a shorter distance (intraprovincial), the majority of migrants is married; as the distance increases (interprovincial moves), the majority is single; but in long distance moves from one country to another (international),

an obstacle) among the international migrants. While 97% of the intraprovincial migrants speak only English at home, 42% of the international migrants speak other languages. The high classification coefficient for home language—the language most often spoken at home—clearly differentiates the international migrants from the other two migrant groups (Table 4).

**Level of education:** Looking at what we have termed the constant personal

Table 4  
**Mobility Status by Home Language**

(Percent)

Mobility Status	Home Language		Total
	English	French/Other	
Stayers	93.2	6.8	53.2
Movers			
Intramunicipal	92.4	7.6	23.6
Migrants			
Intraprovincial	96.5	3.5	15.8
Interprovincial	97.2	2.8	5.0
International	57.7	42.3	2.4
<b>TOTAL</b>	<b>92.9</b>	<b>7.1</b>	<b>100.0</b>

Table 5  
**Mobility Status by Highest Level of Schooling**

(Percent)

Mobility Status	Level of Schooling					Total
	Up to Grade 8	Grade 9 through High School	Non-Univ. with or without Trades Cert.	Some Univ.	Univ. Degree	
Stayers	24.4	42.2	20.8	7.0	5.4	53.1
Movers						
Intramunicipal	14.9	44.0	22.3	8.9	9.9	23.9
Migrants						
Intraprovincial	11.2	39.1	27.0	11.4	11.4	15.5
Interprovincial	5.6	35.2	24.0	15.6	19.6	4.9
International	23.4	19.1	27.7	14.9	14.9	2.6
<b>TOTAL</b>	<b>19.1</b>	<b>41.3</b>	<b>22.4</b>	<b>8.8</b>	<b>8.3</b>	<b>100.0</b>

Table 6  
**Mobility Status by Occupation**

(Percent)

Mobility Status	Occupation								Total	
	Manager	Professional	Clerical	Sales	Service	Primary	Process	Construction		Other
Stayers	9.2	12.5	19.6	9.0	12.7	7.9	14.5	6.2	8.5	48.8
Movers										
Intramunicipal	8.2	16.8	23.0	9.5	10.4	4.2	15.4	6.1	6.4	25.8
Migrants										
Intraprovincial	8.2	21.1	19.7	8.9	11.4	3.4	14.2	7.1	5.9	17.0
Interprovincial	12.2	21.8	14.3	6.8	11.6	3.4	8.8	12.2	8.8	5.7
International	10.4	17.9	11.9	3.0	11.9	3.0	29.9		11.9	2.6
<b>TOTAL</b>	<b>9.0</b>	<b>15.7</b>	<b>20.0</b>	<b>8.8</b>	<b>11.8</b>	<b>5.8</b>	<b>14.8</b>	<b>6.5</b>	<b>7.6</b>	<b>100.0</b>

characteristics, the education variable also distinguishes the international migrants from the other types. The relationship between education and distance of move is clear. The classification coefficient for this characteristic increases with the distance of the move and shows the highest score for international migrants (Table 5 & 8).

**Occupation:** While occupation is not a statistically significant variable, a pattern is to some extent revealed for this characteristic. The occupation coefficient clearly differentiates the international migrants. There are no international migrants employed in construction and they also show the lowest percentages employed in clerical and sales. However, the same occupation, that of professionals, is shown to be the most mobile group in each type of migration, regardless of the distance involved (Tables 6 & 8).

**Income:** The largest percentage of migrants, for each of the three types, falls within the \$20,000-\$39,999 income category. The percentages also follow a relatively similar pattern across the income categories, although the international migrants diverge to some extent showing considerably higher percentages in the lowest and highest income groups. Generally, the discriminating power of the income characteristics is strongest in differentiating between stayers and movers, in particular short-distance (intramunicipal) movers as discussed above. Although the income coefficient is highest for interprovincial migrants, there is little discrimination among the migrant groups (Tables 7 & 8).

Table 10 reveals that 37.09% of the "group" cases are correctly classified. These results could be improved with better quality data. However, using the statistics generated by discriminant analysis, a typology of stayers and migrants is developed based on their personal characteristics.

### The Typology

On the basis of the above findings, the

following typology is developed from scores on the personal characteristics. "H" represents a high score and "L" represents a low score. The scores are derived from the classification function coefficients computed for each characteristic. With the age characteristic, for example, the classification coefficient of 1.17 shown for stayers is the high score while the coefficient of 0.73 shown for interprovincial migrants is the low score (Table 8). The high and low scores therefore reveal the potential of a characteristic to differentiate migrants by type of move, with high scores representing those persons most likely to fall in a particular mover or stayer category and low scores representing those least likely to fall in that category.

The typology reveals the selectivity of migration with respect to personal characteristics, and that selectivity becomes more distinct depending on the type of migration. For instance, a person who scores high on age (is older), high on marital status (is married), high on fertility (has children), low on language (speaks mostly English), low on education (has a lower level of education), and lower on income (has a lower level of income), is generally a stayer. Intraprovincial and interprovincial migrants reveal the reverse of this pattern, although they also score low on language and education. International migrants are somewhat different. They score high on age, marital status and fertility, and also high on language and education, but low on income.

The age differentials conform with the theorized pattern in that "all movers" are mainly concentrated in the younger age categories and, therefore, score low on this characteristic. On the other hand, as people are subject to life cycle events throughout their age span which influence the decision to stay, the score for stayers is understandably high. Among the migrants, the international migrants who are faced with the decision to move a long distance, are shown to be less selective of age and also score high. Marriage

Table 7  
Mobility Status by Income

Mobility Status	INCOME							Total
	0	10,000-	20,000-	30,000-	40,000-	50,000-	75,000+	
	9,999	19,999	29,999	39,999	49,999	74,999		
Stayers	5.5	21.9	17.8	15.8	17.8	5.5	53.2	
Movers								
Intramunicipal	15.5	20.0	24.5	15.5	10.0	10.9	3.6	23.6
Migrants								
Intraprovincial	9.8	18.0	31.1	21.3	14.8	3.3	1.6	15.8
Interprovincial	10.2	13.0	34.9	27.5	5.8	7.2	1.4	5.0
International	20.2	12.5	16.3	25.0	13.5	10.6	1.9	2.4
TOTAL	9.1	20.2	22.3	17.4	13.7	13.2	4.1	100.0

Table 8  
Discriminating Variables Showing their Level of Significance and Classification by Type of Migration

	Vars	Wilks	Sig.	Rao's V	Sig.	Change	Sig.	Lasel
	In	Lambda				In V		
1 Age	1	.93088	.0000	76.10841	.0000	76.10841	.0000	Age
2 Marst	2	.87981	.0000	139.15861	.0000	63.05019	.0000	Marital Status
3 Hlos	3	.84316	.0000	186.54637	.0000	47.48776	.0000	Highest Level of Schooling
4 Homelang	4	.80688	.0000	233.18347	.0000	46.63711	.0000	Home Language
5 Toting	5	.78913	.0000	258.11550	.0000	24.93203	.0001	Total Income
6 Presch	6	.77785	.0000	275.28472	.0000	17.16922	.0018	Presence of Children
7 Ethnicor	7	.77245	.0000	282.73752	.0000	7.45280	.1138	Ethnic Origin
8 Lfact	8	.76793	.0000	299.41483	.0000	6.67732	.1540	Labour Force Activity
9 Occ81	9	.76383	.0000	295.05332	.0000	5.63849	.2278	Occupation

Classification function coefficients  
(Fisher's liner discriminant functions)

	1	2	3	4	5
	Stayers	Intra-municipal	Intra-provincial	Inter-provincial	Inter-national
Age	1.159830	0.8637457	0.7483740	0.7303070	1.056982
Marst	4.792435	4.304524	4.050551	4.455749	4.643656
Presch	2.785195	2.543367	2.504514	2.556219	2.982829
Hlos	1.681055	1.682686	1.791325	2.039805	2.086854
Ethnicor	-0.2925904	-0.2484194	-0.3000129	-0.3674174	-0.8162652E-02
Homelang	15.19848	15.25029	14.52552	14.79529	18.83074
Lfact	4.594404	4.333420	4.438298	4.543382	4.16439G
CCCB1	1.978240	1.944482	1.984954	1.993396	2.265354
Toting	1.328547	1.524816	1.442653	1.493633	1.144651
(Constant)	-33.51763	-30.66614	-29.14948	-31.91908	-40.43961



and the presence of children at home are theorized to suppress migration. In this sample, the proportion of migrants married generally increases with the distance of the move, and the proportion having children present age six or more also increases in long-distance moves; this is indicated by the high score for international migrants on these characteristics.

The high scores for home language reveal that this characteristic is an important factor in all types of moves; however, international movers are the most affected by the language most often spoken at home and score considerably higher. The differentials with respect to level of education are clearly marked by the distance of the move.

The score for highest level of schooling increases with distance and is highest for the international migrants. Finally, in this sample, differentiation according to income is shown to be less distinct. Income appears to be less constraining in moves of shorter distances, which score high, but more constraining in long-distance moves, as indicated by the low score for international moves.

### Concluding Remarks

In this study we have attempted to develop a typology of stayers and movers in Canada on the basis of their personal characteristics. Previous approaches to typology building have examined various aspects of migration from other perspectives, with little or no emphasis

placed on personal factors. While the more restrictive Canada Census definitions used in the development of this typology may limit its universal utility, it nevertheless provides a systematic means of examining types of internal migration in Canada based on the differential characteristics of migrants. A further step toward identifying types of migration on the basis of personal factors could now be achieved by using subsets of the more predictive characteristics and applying cluster analysis.

Generally, the typology could be improved if data of better quality were available. The Canada Census fails to capture some of the important aspects of migration, namely the characteristics and motives of migrants at the time of the decision to move. The typology could be both expanded and refined if data on other personal characteristics were introduced. For instance, Taylor (1969) notes that migrants fall into certain "psychological types". It is possible to conceive that detailed data on the psychological types as well as the personal characteristics of migrants could be obtained from a detailed sample survey, the only means of obtaining such information on migrants.

The typology presented in this paper is, therefore, only a starting point. Future work may build upon this framework and incorporate many other aspects of migrant characteristics.

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## FEMALE INFANTICIDE AND CHILD NEGLECT AS POSSIBLE REASONS FOR LOW SEX RATIO IN THE PUNJAB, 1881-1931

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In undivided India the Punjab province was the one where sex ratio of 855 females per 1000 males, as per 1901 census, was the most unfavourable in the country and has continued to remain so upto now in the Punjab of the Indian Republic. It was unfavourable to all the three major religious groups of the province-877 among the Mohammadans, 847 among the Hindus and 775 among the Sikhs. It was not peculiar to 1901 as it remained almost similar during 1901 to 1931. The sex ratio at birth (SRB) was again the lowest at 896 as an average for the decade 1891-1901, followed by United Provinces of Agra and Oudh (917) & decade was the highest in Madras province at 958. Apparently, the religious factor does not seem to be responsible for the low SRB in the Punjab.

As is well known, before 1921, India had a chequered history of population growth. The death rate exceeded the birth rate in famine years and the years of epidemics. In normal years, birth rate was somewhat higher than the death rate. Hence, the question of controlling population growth by abortion, infanticide or neglect was probably not relevant. The social and cultural practices prevalent in various parts of the country, however, resulted in the neglect of the female child from day one, probably more so in the Punjab. Moreover, female mortality significantly exceeded male mortality in years of epidemics and famines. This paper tries to examine the socio-cultural and economic factors, namely, the system of land holdings and inheritance strategies, structured customs in different parts of the province, and notions of honour and status which probably have been at the back of neglect of the girl child. Among certain caste groups even female infanticide, might not have been uncommon.

With 854 females per 1,000 males\*, sex ratio in the undivided Punjab was most unfavourable in the whole country in 1901. It has continued to remain so in the Punjab of the Indian Republic as well. It was unfavourable to all the three major religious groups of the province-877 among the Mohammadans, 847 among the Hindus, and 775 among the Sikhs. It was not a peculiarity

of 1901 alone as it remained almost similar during the decades 1881 to 1931 (Table 1). Apparently, the religious factor does not seem to be responsible for the very low sex ratio in the Punjab.

In most populations in the world, sex ratio tends to be favourable to females even though males outnumber them in younger ages due to slightly more males being born than

\* While the sex ratio in the international parlance is defined in terms of males per 100 females, following the British practice, Indian census has defined sex ratio in the total population as females per 1,000 males, and most of the available literature in India dealing with sex ratio has been published on this basis. In this paper I have, consequently, used the British definition of sex ratio. The sex ratio at birth is also defined here in terms of number of female births per 1,000 male births.

females (sex ratio at birth varies between 102 and 108 males for every 100 females for biological reasons). But this advantage of males gets neutralized by about the age of 20 due to

higher mortality among males than females as the latter have greater resistance power to diseases than males. In India, and in some other countries of South Asia, West Asia and Africa, the situation

Table 1

**Ratio of Females per 1,000 Males in the Punjab by Religion and Natural Divisions, 1881-1931.**

Natural Divisions	Year	Religion					
		Total	Hindu	Muslim	Sikh	Christian	Jain
Punjab and Delhi	1881	844	-	-	-	-	-
	1891	850	843	871	784	465	872
	1901	854	845	878	779	580	853
	1911	817	820	833	746	707	850
Punjab Excluding Delhi	1921	828	829	844	765	786	860
	1931	831	835	839	793	803	a
Indo-Gangetic Plain (west)	1881	836					
	1891	839					
	1901	842					
	1911	795					
Excluding Delhi	1921	805	808	827	755	796	874
Excluding Delhi	1931	813	812	825	790	814	a
Himalayan	1881	878					
	1891	890					
	1901	892					
	1911	901					
	1921	907	913	737	694	1,111	614
	1931	906	917	725	717	900	a
Sub-Himalayan	1881	856					
	1891	863					
	1901	880					
	1911	827					
	1921	852	823	880	791	765	815
	1931	847	832	863	804	785	a
North-West dry area	1881	835					
	1891	847					
	1901	838					
	1911	825					
	1921	827	801	835	784	786	723
	1931	831	813	838	792	804	a

**Note :** The figures for the years 1881 to 1901 include the North-West Frontier Province and Delhi. The latter was made a separate Province after 1911; hence, the figures for 1921 and 1931 relate to the Punjab (including Punjab states) but exclude Delhi. a) For some reasons, the sex ratio for the Jains in the Punjab in the 1931 census was not available.

The figures for 1911 exclude North-West Frontier Province but include Delhi.

**Source :** Census of India 1921, Volume XV, Punjab and Delhi, Part I, Report. Lahore: Civil and Military Gazette Press, 1923. pp. 227, 236-37.

Census of India 1931, Volume XVII, Punjab, Part I, Report. Lahore: Civil and Military Gazette Press, 1933. pp. 159-60.

is different due to female neglect not only in childhood but in almost all ages.

There can be four possible reasons for the continued low sex ratio over time: (1) females are missed to a much greater extent in population censuses than males; (2) net internal and international migration has been favourable to males; (3) sex ratio at birth is much more favourable to males than in other parts of the country (or world); and (4) female mortality has been higher than male mortality (Premi, 1991, 38). I shall examine these factors one by one in the case of the Punjab but, before doing so, it would be useful to examine the quality of the census and registration data.

### Census Counts in India

Until the 1931 census, enumeration in India was a one-night *de facto* affair in which all movements of the people were stopped and the enumerators collected information about people at the place of enumeration. These censuses required a large army of enumerators to cover the entire country in one day and provided little supervision of enumerators' work. As there were no post enumeration checks of those censuses, it is difficult to comment on the quality of enumeration.

In writing the report on the 1911 census, the Census Commissioner of India, Mr. E.A. Gait, recognised that "natives of India are reticent regarding their women, and that in some parts women are regarded as of very little account. It is therefore natural to suppose that the return of them at the census should be incomplete" (Census of India 1911, 1913, p.209). Moreover, among the Muslims and the high caste Hindus, women were kept secluded and, if they must go outside the house or talk to some other men, they must cover themselves with a veil from head to the ankle among the Muslims, and cover head and face among the Hindus and Sikhs. Yet another factor prevailing in the north-western part of the country, specially with the people in the Punjab at the time of the 1881 census, was that the British needed women for the soldiers fighting the

war with the Afghans, and if information was revealed about them, the British army would forcibly take away those young girls and women. In one place the people hurriedly wedded their marriageable girls to save them from impressment (Denzil Ibbetson, quoted in Barrier, 1981, pp xii-xiv). Gait still thought that the enumeration of women in the Indian censuses particularly in those conducted by him, could not have been very bad "as the enumerator was usually a fellow villager and a near neighbour. The heads of families would have no particular reason to avoid mention of their women; and even if they did so, the enumerator's local knowledge would enable him to detect the omission. Lastly, if reticence had any effect, he felt that it would reduce the proportions of females of Muhammadans much more than those of Hindus; but, in almost all parts of India, the proportion of females amongst the adherents of that religion is relatively high" (Census of India 1911, 1913, p.210). Further, in the Punjab, where the general proportion is very low, it is lowest among the Sikhs who, on the whole, are least reluctant to talk about their women. The deficiency of females in the north-west of India is a real fact which is shown not only by the census returns, which are just as accurate there as in other parts of India where females predominate, but also by the social conditions, such as the very high bride prices which are commonly paid there amongst the communities which take money for their daughters and the extensive traffic in women (Census of India 1911, 1913, p.210). One may, therefore, assume that although the earlier census counts were one-night affair, they were reasonably correct and there was no systematic missing of females.

Dealing with the subject of accuracy of the census count in the 1921 census of the Punjab, Middleton and Jacob had concluded that an error of 1 per cent might be adopted as a working hypothesis of the difference between the actual and the enumerated population. They further say that "it seems likely that the greater

part of the assumed error will be due to the omission of females, and a smaller part due to the omission of males. It might be possible, for example, that the error in the enumeration of males accounts to only, say, half per cent whereas the error of omissions in the case of females might amount to over one and a half per cent. Adopting these figures for the error, hypothetically, we find that the percentage error in the proportion of males to females in the 1921 census will be just over 1 per cent. If this is so, all the figures showing the number of females per 1,000 males will have a standard error of about eight or nine. These possibilities must be borne in mind when comparing the proportions of the sexes at different censuses and at different localities. For example, the number of females per 1,000 males in 1911 was 817, as against 826 (828 in Table 1) in 1921. The difference in these figures being less than the standard error of their difference on the above assumptions, it would be somewhat unsafe to deduce that there has been a real increase in the number of females per 1,000 males during the last decade. The same reasoning would apply in comparing, say, the proportion of females per 1,000 males in Jullundur (807) with that of the adjoining State of Kapurthala (816), it being possible that the observed differences are solely due to errors in enumeration, and not to any fundamental change in the racial or economic causes" (Census of India 1921, 1923 (hereinafter denoted by Punjab Census Report), pp 224-25).

While small differences in the sex ratios can be construed to be due to errors in census enumeration but that does not explain the very low sex ratio in the Punjab.

Table 1 gives the sex ratio for the Punjab by natural divisions and religion. There have been some boundary changes over the fifty-year period covered by this table as North-West Frontier Province was separated before the 1911 census and Delhi was made a separate province after the 1911 census. Consequently the province level figures are not strictly

comparable. The sex-ratio in the Punjab province increased between 1881 and 1901 but suddenly fell from 854 at the previous census to 817 in the 1911 census. It improved to 828 in 1921 and to 831 in 1931. The pattern has been almost similar with all the three major religious groups, and in the Indo-Gangetic plain (west) and in the sub-Himalayan regions. In contrast the Himalayan region shows a monotonically rising sex ratio over the past fifty years. Cross-classification of sex ratio by religion and natural divisions is available only for 1921 and 1931 censuses. One finds that while Muslim's sex ratio was generally higher than that of the Hindus, but in the Himalayan region it was only 737 in 1921 and 725 in 1931 for the Muslim, indicating very substantial shortage of females there. In contrast, the sex-ratio of the Hindus in that division was much higher at 913 in 1921 and 917 in 1931. The Muslims in the Himalayan region included a large number of male migrants for employment which depressed their sex ratio there. In contrast, there has been male migration of the Hindus from the hills to the plains to eke out a living leaving their women and children behind to look after cultivation.

### The Vital Registration System

In the Punjab registration of deaths dates back to 1867, and that of birth to 1880. As the system existed in the rural areas at the beginning of the present century, the village watchman was entrusted, under the supervision of the village headman and the higher revenue officials, with the duty of registering births and deaths. On every visit to the police post (thana) in his area, he will go and report whether any birth or death had taken place in his village after his last visit; this information was then recorded at the thana office in an appropriate manner. Though the village chowkidar was almost invariably illiterate, this agency was so closely supervised in British districts that the registration was, in general, exceedingly accurate, and its results were in

close agreement with the census returns. In municipalities and cantonments registration was in the hands of the local authorities and was often defective. The system of compilation was anomalous. The cantonment returns were excluded from those of the Province altogether, as were those of such Native States which registered births and deaths.... In each Division the inspector of vaccination was also charged with the duty of inspecting the birth and death registers which greatly improved the accuracy of the returns (The Imperial Gazetteer of India, Vol XX.(n.d), p.281). The census reports for the Punjab for the 1921 and 1931 censuses further record that there was improvement in the vital registration system in the Province (Punjab Census Report 1921, 1923, p.42; Punjab Census Report 1931, 1933, p.152).

To check further the accuracy of registration records, the registered death rates are compared here with the estimated death rates over time by using (a) quasi-stable population model, and (b) forward projection method (Table 2). Compared to quasi-stable population model

estimates, the registered death rates for both males and females are much lower for all the decades between 1891 and 1931. The differences are not so sharp when compared with the forward projection estimates. In contrast, a comparison of the birth and death rates calculated by the Census Actuary for the Punjab for the 1901-11 decade with the registered birth and death rates (reported birth rate 41.2 and computed 44.3; and reported death rate 44.0 and computed 43.3) shows a close agreement. As the indirect estimates are very much dependent. On a number of assumptions made in their computations and as there are vast differences among the indirect estimates, one may conclude, particularly in view of the closeness of the reported and Census Actuary's estimates, that the reported birth and death rates in the Punjab were fairly close to reality. Having said so, it would be useful to consider the sex differentials in mortality and to what extent it explains the low sex ratio in the Punjab. One may, however, first examine the sex ratio at birth.

Table 2

**Registered Death Rates in the Punjab and the Estimated Death Rates of the North Zone by (a) quasi-stable population model, and (b) forward projection method, 1881-1931.**

Nature of estimates	Sex	Census decades				
		1881-1891	1891-1901	1901-1911	1911-1921	1921-1931
Registration records (for British Territory)	M	33.9	33.2	41.5	34.0	29.1
	F	35.3	35.7	47.6	38.6	31.4
Quasi-stable estimate	M	n.a.	53-55	47-49	46-48	34-36
	F	n.a.	55-57	53-55	48-50	36-38
Forward projection method	M	47.6	32.7	b	36.7	29.7
	F	44.3	b	43.1	b	40.7

Note: a) Both the indirect estimates based on quasi-stable technique and on forward projection method relate to the Northern Zone of India as defined in the 1971 Census

b) Estimates not constructed because out of the 9 estimates of  $e_5$  made from the nine age sectors, more than four were below the lowest value of  $e_5$  in West Model Life Tables (Mukherjee 1976:214).

c) Registration death rates are computed from data on male and female deaths and the censused population. In doing so, population as counted at the beginning of the period is taken in the denominator instead of computing the population estimate at the mid-point of the decade.

Source: Punjab Census Report 1931, p.150.  
Mukherjee, 1976, pp. 197, 201, 214.

## Sex Ratio at Birth

In examining this aspect two issues are relevant here: (a) how was the Punjab province placed in relation to the rest of the country in this regard, and (b) what has been the pattern of sex ratio at birth (SRB) in the Punjab during the fifty-year period covered by this paper.

Table 3 gives the sex ratio at birth as mean of the figures for the decade 1891-1901 for different provinces. It was the lowest in the Punjab at 896 females per 1,000 males followed by the United Provinces of Agra and Oudh (917) but was the highest in Madras at 958. The sex ratio of 854 in the total population was lower than the SRB indicating that females

Table 3

### Proportion of Female Births per 1,000 Male Births in the Indian Provinces, 1891-1901.

Province	Mean of 1891-1901
Punjab	896
United Provinces	917
Bombay	925
Assam	929
Lower Burma	931
Berar	936
Central Provinces	940
Madras	958
"Proclaimed clans" (Infanticide Act)	940

**Note:** The range within each area is greatest where registration is at its worst in regard to events.

**Source:** The Imperial Gazetteer of India, The Indian Empire, Vol. I, (Reprint edition). Today & Tomorrow's Printers and Publishers (n.d.), p. 510 children from 1901 onward, one finds that it has fluctuated between 892 and 913, being considerably below the known values for other areas in India or other parts of the world.

were neglected at subsequent ages in comparison to males. Moreover, the SRB in the Punjab has been very unfavourable to females throughout the fifty year period between 1881 and 1931 (Table 4). As the birth registration in that province started from

1880 only, there is likelihood of certain omission in birth recording in the earlier years but, as discussed earlier, later registration data seem fairly reliable. Considering the registered births of male and female.

Table 4

### Sex Ratio at Birth (number of girls per 1,000 boys) in the Punjab, 1881-1931.

Year	Recorded births		Number of females per 1,000 males
	Males	Females	
1881-1885	1,962,661	1,700,387	866
1886-1890	1,967,692	1,707,263	868
1891-1895	1,934,503	1,736,726	898
1896-1900	2,114,495	1,932,037	914
1901-1905	2,192,234	1,991,027	908
1906-1910	2,148,084	1,954,896	901
1911-1915	2,318,349	2,116,403	913
1916-1920	2,228,293	2,005,451	900
1921-1925	2,212,671	1,974,740	892
1926-1930	2,361,149	2,110,126	894

**Sources:** Punjab Census Report 1931, p.152.

The determination of sex at conception, undoubtedly governed by some law of nature, is one of those phenomena that have not been completely understood or explained. Some theories have been advanced about the males preponderating in births during periods following famines or war, and the females during periods of prosperity and comparative freedom from disease (Punjab Census Report 1931, 1933, p.152). From the figures in Table 4, one finds that the proportion of female children born increased from 1881 to 1900, and was highest at 914 during 1896-1900 although 1898 and 1899 witnessed famine in the Punjab and the death rate rose from 29.5 in 1899 to 49 in 1900 due to severe epidemic of malaria and cholera. The proportion fell to 908 in the 1901-05 quinquennium during which Punjab suffered from severe plague. It further fell to 901 in the subsequent quinquennium which included 1907, the worst year of plague.

The proportion of female births again rose in the comparatively prosperous period of 1911-15, and declined during the next quinquennium, which witnessed one of the worst influenza epidemics in 1918. When we come to the last decade, we find that the proportion of female births drops even lower than any figure since 1891. Thus, the above statement of the Superintendent of Census Operations of the Punjab for the 1931 census does not get validated by the available data. Probably unsatisfied himself, he raised a number of questions in his report in this respect asking, "Is it due to any increase in female infanticide, or any faulty registration?" The question of female infanticide will be discussed a little later in this paper, but it has already been shown that the registration system, if anything, improved of late years, particularly in rural areas. He then further raises the question, "What then is the reason for the decline in the proportion of female children at birth in this Province? Is not this the result of some law of nature, which in order to prevent too rapid a growth of the population of this Province has reduced the number of females? Is not this check of nature a warning that the Province is becoming over-populated, or at least there is a danger of its becoming so in the near future?" He felt that "the check of nature on the population of this country is not a thing unknown. Formerly it used to operate in the form of famines and epidemics, but since man to a great extent subdued both these agents by his engineering or medical skill, the check seems to have become operative in another direction" (Punjab Census Report 1931, 1933, p. 152). This assumption needs verification with certain additional information not only for the Punjab but for the whole country as the population growth rate during the 1921-31 decade was somewhat higher in the whole country and not only in the Punjab. There is also a need to understand the causes for much lower sex ratio at birth in the Punjab Province than in other parts of the country as also other countries of the world for which such data

were available at that time.

While the Superintendents of Census Operations were examining the question of very low sex ratio in the Punjab from different angles, they seem to have paid very little attention to the biological issue involved here. Male sperms carry the X and Y chromosomes to the female body which produces egg having X X chromosomes. What makes the Punjabi women, whether they are Hindu, Muslim or Sikh, to have much higher male conceptions than in any other part of the world? This issue needs to be examined at a greater depth probably by the biologists.

### **Differential in Male and Female Mortality**

In all developed and a majority of developing countries the usual pattern is that the mortality of the females at different age groups is lower than that of males and, therefore, the initial disadvantage of females at birth is covered by age 20 or so and, thereafter, there are more females at each age than males in a natural population. In India, this has not been so since the female mortality has remained higher than male mortality at least till the age of about 45, as will be seen in the analysis that follows by considering the data for the Punjab.

Table 5 presents the decadal death rates for males and females from 1881 to 1930 and Figure 1 presents the annual death rates. In computing these figures, the population at the beginning of the decade counted in the census has been taken as the denominator instead of taking the interpolated population. This has been done because even the interpolated population would not have represented the true picture for each year as the annual deaths fluctuated substantially depending upon whether the particular year suffered from famine or some epidemic or if it was a normal year. Over the fifty years covered by the graph, in none of the years female mortality was lower than male mortality. Further, the



gap between male and female mortality was greater in years of epidemic than in famine years as is clear from Figure 1. For example, the difference between male and female death rates during the plague years from 1901 to 1905, 1907, 1908, 1915, 1924 and 1926 is greater than

handle the grain for thrashing and grinding. They nurse persons suffering from plague; and, when death occurs in a house, they assemble there for mourning and sit around the corpse. They are thus much more exposed to infection through the rat-flea, which attacks

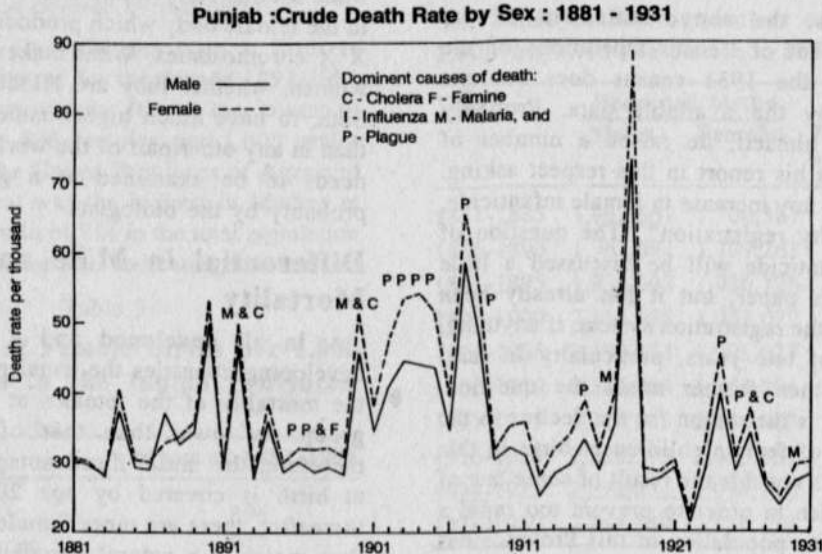


Table 5

**Decadal Death Rates per mille by Sex in the Punjab (British Territory only), 1881-1930**

Year	Male	Female
1881-1890	33.9	35.3
1891-1900	33.2	35.7
1901-1910	41.5	47.6
1911-1920	34.0	38.6
1921-1930	29.1	31.4

Source: The figures of male and female deaths have been taken from Punjab Census Report 1931, 1933, p.150.

Note: The figures for 1881-1890, 1891-1900, and 1901-1910 include Delhi province as well which was part of Punjab Province till then.

in normal years. It was because "women spend much more time than men in their houses, in which they sit most of the day. They generally go barefooted. They sweep the floors and

Table 6

**Sex-age, specific reported death rates per mille, Punjab and Delhi for 1911-20 decade and Punjab for 1921-30 decade.**

Age group	1911-20		1921-30	
	Male	Female	Male	Female
All Ages	34	39	29	31
Under 1	225	213	189	183
1-4	62	65	50	49
5-9	15	18	12	13
10-14	13	18	12	15
15-19	15	20	15	19
20-29	16	20	13	15
30-39	19	24	15	18
40-49	25	26	22	23
50-59	36	38	32	32
60 and over	79	84	61	66

Sources : Punjab Census Report, 1921 p. 220  
Punjab Census Report, 1931, p. 146

human beings when its natural host dies ....A similar explanation would account for greater mortality of women from malaria" (Census of India 1911,1913, p.212).

One may also examine the sex and age pattern of mortality in the Punjab which will explain the increased deficiency of females after the one observed at the time of child birth. As is clear from Table 6, the male mortality was somewhat higher than female mortality up to age 4 or 5 Later, especially in the reproductive age group, female mortality became much higher both in terms of absolute numbers and the proportion. The difference narrowed very substantially after age 40 but increased again for the older people of age 60 and above where the sex differential in mortality again increased.

Whereas the data of Table 6 establish that the infant and early childhood mortality of females was less, we also read about female infanticide and neglect of the female child in the Punjab. Moreover, infant mortality rate data for the years 1901, 1902, 1903 and 1904 indicate male IMR of 246, 233, 260, and 223 respectively while the female IMR for these years was 260, 242, 270, and 229 respectively, clearly pointing to the fact of higher female IMR than that of males. It is quite likely that there was substantial reduction in the female IMR in later years due to improvement in the care of the girl child, but there can also be greater under-reporting of female infant and toddler deaths during the 1911-20 and 1921-30 decades as there is not much evidence to show any significant improvement in that respect. Moreover, we have already seen a decline in the SRB during the 1920s which may also be due to under-reporting of the female births. I shall now examine the role of female infanticide and neglect of girls in the observed sex ratio in the Punjab.

### Female Infanticide

As regards female infanticide, the Census Commissioner for India for the 1911 census wrote "Hypergamy, or the rule that a girl must

be given in marriage to a man of higher rank, makes it difficult and very expensive to obtain a suitable husband, while the admission of inferiority which is implied in giving a girl in marriage is a blow to a man's pride. Apart from this a Rajput husband often tyrannizes his father-in-law. Female infanticide was resorted to in order to avoid these troubles which the marriage of a daughter involved. This practice is of very old standing in north-western India. The practice was found to be extremely prevalent in the United Provinces, the Punjab and Rajputana amongst various sections of the population, especially Khatris, Rajputs and Jats and all classes of Sikhs. With the Jats, it frequently happened that where several brothers lived jointly, the eldest alone married and the younger brothers shared his wife. There was thus no need for many women. In most cases infanticide was practiced to a limited extent, and the first and possibly the second daughter would be allowed to live, especially when there were also several sons. But in some tribes every single daughter was killed, so that sometimes not a single girl was to be found in a whole village. After other measures to put a stop had been tried and found unsuccessful, an Act (VIII of 1870) was passed with the object of placing under police surveillance the communities suspected of the practice (Census of India 1911, 1913, pp. 215-16).

The British were of the view that female infanticide which prevailed to a considerable extent at the time of the annexation of the Punjab, had dwindled down to insignificance by 1911; and wherever it existed it was confined to individual families, or groups of families and that its extent was not sufficient to influence the proportion of sexes 'in any particular caste or locality as a whole, much less that of any caste or religion in the whole province. The Superintendent of Census Operations of the Punjab said that the situation had further improved since 1911 and presented certain data for the districts of Lahore, Ferozepure, Jullundur, and Ludhiana (where

the practice was believed to be most prevalent) to indicate the above contention (Punjab Census Report, 1931,1933 p.154). If this contention is accepted, one would question the decline in the sex ratio at the birth from 913 during the 1911-15 quinquennium to 900 in the 1916-20 quinquennium and further to around 893 during the 1921-30 decade. Hence, the explanation of the Superintendent of Census Operations of the 1931 census quoted above is not very convincing. Further, Darling writing about the Punjab peasants in prosperity and debt said in 1925 that "in spite of the deplorable shortage of women, female infanticide still persists.[Although] this would be difficult to prove, but those who are in a position to know are agreed that it exists here and there, where caste is high and suitable husbands few" (Darling, 1925, p.51). He further quotes a deputy commissioner of Jullundur who remarked some twenty years ago [around 1905] "the girls are sacrificed in order that loans for their marriage expenses may not encumber the land descending to the sons. The birth of a daughter is regarded as the equivalent of a decree for Rs. 2,000 against the father". Today Rs. 2000/- would mean just US \$ 70 but in those days this amount could easily buy around 800 grammes of gold or some 25 acres of land (Shigemochi, 1978, 130) (Darling, 1925, p.51). It is not that people belonging to certain castes among Hindus and Sikhs alone killed their daughters, but the practice seems to have been prevalent among the Muslims as well. This is established in the first instance by an almost equally low sex ratio among the Muslims as was found among the Hindus of the region. Secondly, father's emotion at the birth of a girl are well described in the Quran by saying "And when a daughter is announced to one of them, his face becomes black and he is full of wrath. He hides himself from the people because of the evil that which is announced to him. Shall he keep it with disgrace or bury it in the dust" (Darling, 1925, p.51). My analysis in this paper stops at 1931 but I have a fear (not any empirical evidence)

that the practice still continues among some special caste groups not only in the Punjab and Haryana, but in certain other parts of the country as well.

### Neglect of Females

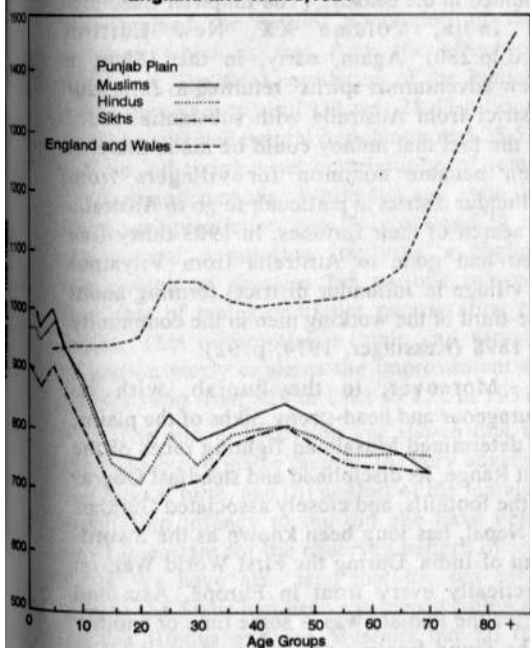
In the Punjab the lowest proportion of females is found amongst Jat Sikhs (702), Hindu Rajputs (756), Gujjars (763) and Hindu Jats (774). Infanticide at one time was notoriously prevalent among all these communities. Castes such as Kanet (947), Dagi and Koli (934) and Jogi Rawal (1,035) that were never suspected of the practice had a much larger proportion of females. The Superintendent of Census Operations of the Punjab for the 1911 census, Pandit Hari Kishan Kaul, felt the amount of actual infanticide was then insignificant, but that the neglect of female infants was the general rule. He wrote "Girls are usually insufficiently clad and less trouble is taken to protect them from heat and cold than is the case of boys. In the illness of female children no notice is taken unless the ailment becomes serious, while the slightest indisposition of a boy upsets the whole family and the best available medical assistance is summoned.... But the neglect of the female infants, which has probably been the most important cause of the disparity of sexes, is diminishing rapidly, owing partly to the spread of education and partly to changes in customs" (Punjab Census Report 1911)

Female neglect in the Indian society, particularly in the Punjab can best be understood by comparing the number of females with the number of males at given ages. In making this comparison it is well recognised that the age data in the Indian census suffer from age heaping at digits ending in zero and five as also from absence of knowledge of the exact age of the individuals. It may also be mentioned that the information in the census is given by the head of the household (usually a male) who most often does not know the exact age of each one of the family members, especially of the

daughters-in-law and other members if the household is large. Females who are married but have no child continue to remain in the 10-14 age group but if there is a child, her age is reported between 15-19 age group. Moreover, improvident mortality of females due to early child bearing results in their low proportion in the 10-19 age group. Age pattern of sex ratio for the three main religious groups in the Punjab-Muslims, Hindus, and Sikhs-for the year 1921 is presented in Figure 2. As a contrast, it also presents the sex ratio of the population of England and Wales for 1911. In England and Wales, after age 20, the sex ratio never fell

below, 1,000 and became more and more favourable to females after age 50. In contrast, the sex ratio in the Punjab was not at all favourable to females at any age; the figure for age 2 and 4 for the Muslims when the sex ratio is 1,000 is most likely the result of errors in age reporting. The sex ratio becomes the lowest in 15-19 age group for all the three religious groups, it improves slightly in the 20-24 age group but falls again in the 25-29 age group. The sex ratio after the age of 40-49 falls further unlike the pattern in England and Wales. It is also noteworthy that the sex ratio of the Sikhs has been substantially lower than that of the Muslims and the Hindus at all

Sex Ratio of Punjab Plain and England and Wales, 1921

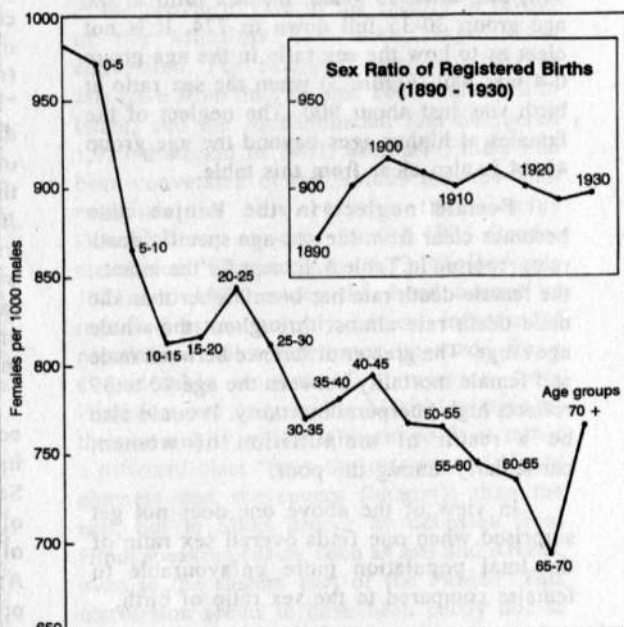


Source: Punjab Census Report, 1921 p. 233 Fig. 2

Figure 2: Proportion of Females per 1,000 Males according to Age Groups for England and Wales, 1911, and for the Punjab (Indo-Gangetic plain only) separately for Hindus, Muslims, and Sikhs, 1921 census.

Source: Copied from Punjab Census Report 1921, 1923 p.233.

Punjab :Sex Ratio by Age Groups, 1931



Source: Punjab Census Report, 1931 p. 156

Fig. 3

Figure 3: Number of Females per 1,000 Males at different ages together with quinquennial sex proportion between recorded births of both sexes.

Source: Copied from Punjab Census Report 1931, 1933 p.156.

ages. Among the Sikhs, it was as low as around 630 in the 15-19 age group which requires some explanation and, therefore, a deeper probe. While there is no reliable evidence to show that the tendency to neglect the female children is more powerful in certain communities and caste than in others, but prima facie it is probable that neglect of female children varies to some extent with economic circumstances (Punjab Census Report 1931, p.201).

Figure 3 gives the sex ratio for different age groups as reported in the 1931 census of the Punjab and contrasts it with the sex ratio at birth for different quinquennia. For example, the sex ratio at birth during 1896-1900 was 914; but, after 35 years, the sex ratio in the age group 30-35 fell down to 724. It is not clear as to how the sex ratio in the age group 0-4 was 980 (Figure 3) when the sex ratio at birth was just about 900. The neglect of the females at higher ages beyond the age group 40-44 is also clear from this table.

Female neglect in the Punjab also becomes clear from the sex-age specific death rates reported in Table 6. Except for the infants, the female death rate has been higher than the male death rate almost throughout the whole age range. The greater difference between male and female mortality between the age 10 to 39 reflects high puerperal mortality. It could also be a result of malnutrition of women, particularly among the poor.

In view of the above one does not get surprised when one finds overall sex ratio of the total population more unfavourable to females compared to the sex ratio of birth.

### Internal and International Migration

As regards migration, a Punjabi has been free from the disinclination to emigrate which is so strongly felt in other parts of India. Uganda, Hong Kong, the Straits Settlements, Borneo, and other countries attracted large numbers of them during the latter part of the

nineteenth century of military and other services. More than 25,000 Punjabis were believed to have been resident in Uganda in 1901; and though no precise estimate of the total number of emigrants out of India can be made, it must have largely exceeded the number of immigrants. Further, according to the 1901 census, the outmigrants to the rest of India from the Punjab numbered more than 500,000, exceeding the immigrants by over 200,000. Immigration was mainly from United Provinces and Rajputana, but Kashmir also supplied a large number. Outmigration was mainly to same territories, but service in the army and military police took more than 20,000 persons to Burma and many to other distant places (these were the lifetime migrants as counted in the census). (The Empirical Gazetteer of India, Volume XX, New Edition (n.d.)p.280). Again, early, in the 1890s, a "few adventurous spirits" returned to Jullundur district from Australia with substantial proof of the fact that money could be made there. It then became common for villagers from Jullundur district in particular to go to Australia in search of their fortunes. In 1903 thirty-five men had gone to Australia from Vilyatpur (a village in Jullundur district) forming about one-third of the working men in the community in 1898 (Kessinger, 1974, p. 92).

Moreover, in the Punjab, with its courageous and head-strong Sikhs of the plains, its determined Musalman fighting races of the Salt Range, its disciplined and steadfast Dogras of the foothills, and closely associated Gurkhas of Nepal, has long been known as the Sword-Arm of India. During the First World War, on practically every front in Europe, Asia and Africa the Punjabi was at some time or another to be found fighting and laying down his life in a struggle of which he dimly realised the meaning; and in his distant home country his relations were training and rendering themselves fit to join him (Punjab Census Report 1931, 1933, p.50). "Among Punjabi Rajputs, the love of soldiering is their best trait. In Hoshiarpur, for example, 50 per cent

of the Hindu Rajputs of military age enlisted themselves during the war" (Darling 1925, p.34). This, in effect, implies that men moved out of the Province either to try their fortunes in agriculture or to serve the British army and it should, therefore, result, at least to some extent, in improvement of sex ratio in favour of females but this impact is not reflected in the observed sex ratio of the province.

As a rough and ready estimate by excluding the immigrants (persons born elsewhere but enumerated in the province or princely states) and including the outmigrants (persons born in province or state but enumerated either in other parts of India or outside the country) in the actual count of the 1931 census, the Census Commissioner of India has obtained the natural population of the province which is free from the effect of migration. The total population of the Punjab (including Agency) in 1931 was 28.49 million and the estimated natural population was 28.52 million indicating a net outmigration of some 33 thousand persons. While the sex ratio in the actual population was 831, it was 824 in the natural population implying a higher immigration of females for various reasons than that of males or higher outmigration of males. This differential in male and female migration partly explains the improvement in the sex ratio from 828 in 1921 to 831 in 1931.

The above discussion has shown that in the Punjab two major factors- (a) very adverse sex ratio at birth, and (b) neglect of the females right from infancy to the old age have been most important for the observed pattern of sex ratio. We have also seen that the sex ratio among the Sikhs had been the lowest followed by the Hindus and the Muslims but all the three religious groups depicting sex ratios much below those found in other parts of the country. This probably meant that the neglect of the female child in the Punjab was not peculiar to the Sikhs, but was a general pattern of the province. Further, while there had been systematic male migration to join the army and the police, there was also net

immigration of females from the neighbouring provinces and states. Both these factors in a way helped in improving the sex ratio in favour of females but the influence was not very much visible, probably because the numbers involved were not very large. Having said, so, it would be useful to examine some socio-cultural, and economic factors for the particular behaviour of the three religious groups and also of the dominant castes among them.

## **Socio-Cultural and Economic Factors.**

### **Socil-Cultural Factors**

As described earlier in this paper, Muslims formed the dominant religious group in the province. One of the factors in favour of the Muslims had been large scale conversion. For example, large numbers of Jats have from time to time been converted to Islam, and the Muhammadan Jats numbered 1,957 thousand in 1901. Similarly, there had been conversion of the Hindus into the Sikh religion. In this respect the Census Commissioner of India for the 1931 Census mentioned "The increase of 33.9% [between 1921 and 1931] under this head cannot be regarded as an entirely natural increase of population. Allowance must be made for a considerable amount of conversion from Hinduism not only in the Mazhbi section of the community, which is recruited from rather a different class 'from the category of Hindu chamars and scavengers (bhangi)] than the rest, but in Sikhs proper by adhesion from Hindi speaking castes, such as Jats and Aroras, even in the eastern part of the Punjab. This conversion seems to have been partly due to the impression that there was something to be gained by belonging to a community comparatively speaking little represented in Government service..." (Census of India 1931, 1933, p.388).

When one looks at the proportion of females to males in different castes, the 1921 census of the Punjab reported that the Hindu castes with low proportion of females were

Rajput (796), Ahir (794), Jat (789), Chhimba (780), Gujjar (778), and Sansi (720). Among the above castes, the Rajput was notorious for the practice of female infanticide; while, of the others, the Sansi was a criminal tribe, and the Gujjar, though in numbers a large proportion of agriculturists, was also a caste with a somewhat unsavoury local reputation (Punjab Census Report 1921, p.228). Among the Sikhs, Khatri alone (917) have a large proportion of females per 1,000 males, while Tarkhans (carpenters) (795), Nais (barbers) (769), and Jats (726) have the lowest proportion of females. Female infanticide probably accounts for the low proportion of females among Jat Sikhs, but there was no particular evidence of the existence of this custom among Sikh barbers and carpenters. Among the Muslims, the highest proportion of females was among the Khojas (975) followed by the Maliar (923), Awan (907) and Qassab (904). The two lowest castes are Sheikh (780), and Harni (725), all the other Muslim castes had their sex ratio between 800 and 900. The Harni, like the Hindu confrere the Sansi, belonged to a criminal tribe, and the fewness of the number of females among them may be attributed to this cause; but the lowness of the number of females among the Sheikhs was probably resulted from the concealment of the existence of their womenfolk (Punjab Census Report 1921, 1923, p.228).

**Marriage pattern :** The hypergamy rule prevailed in the Punjab not only among the high caste Hindus but equally so among the Muslims and the Sikhs. Moreover, such marriages involved heavy dowry and care of the bridegroom's party at the time of the marriage; both these things needed a lot of money and often resulted in indebtedness. For example, with the possible exception of the Sikh Jat, there used to be no one who would spend more on marriage than the Hindu Rajput, since izzat (honour) demanded that the whole neighbourhood should be royally entertained and that dancing girls and fireworks would be part of the entertainment (Darling 1925, p.34). Further, the caste rules not only limited the

scope of choice in marriage, but also made it difficult to find suitable brides and bridegrooms. This led to early and infant marriages and was, in some measure, responsible for heavy dowry and female infanticide among the Khatri and the Rajputs in the past (Saini 1975, p.52). Probably to save themselves from this difficult situation and dishonour, people belonging to certain caste groups, particularly the Rajputs, the Jats, and the Khatri resorted to female infanticide and child neglect.

There are, however, two other important practices—polyandry and bride price—which have been practiced in the Punjab in varying degree in different regions and among different caste groups.

**Polyandry :** Polyandry was widely practiced in the upper Himalayas, that is, Lahaul, Spiti, and Saraj; Rampur, Chini and upper minor princely states. It was practiced more or less openly by the lower castes throughout the Himalayan area, and, as a matter of fact (though the custom not openly admitted) by the Jats of the plains (Saini, 1975, p.71). Polyandry as practiced in the Punjab involved the eldest brother marrying a woman and all the brothers in the family usually sharing the same. The practice seems to have dwindled by the 1920s, if not completely eliminated in the plains and was being given up in the hills (Saini, 1975, p.72). Pettigrew, however, found the practice continuing to a certain extent in the mid 1960s among the Sikh Jats of Ludhiana district in the Punjab. The practice seems to have been associated with less well-to-do families owning not enough of land for all because of the need to keep small land holdings undivided (Pettigrew, 1975, p.53).

Further, if a man's brother died it was his family duty to take over his brother's widow although he might have a wife himself. This was also with a view to keep land within the family and prevented women from causing succession disputes between brothers. When widows tried to hold on to property rights as individuals, frequently they were murdered (Pettigrew, 1975, p.53).

It is but natural that, under such a social system, cohabitation would be at its maximum and in non-contraceptive society like the Punjab of the first quarter of this century, the difference between fecundity and fertility should really be small. One would then expect at least 10 live births per woman who had passed the reproductive age. The available data on fertility for the Sikhs indicate that the maximum number of live births was just 5.8 (Census of India 1931, 1933, p.209) which was a little too low. This would then imply a large scale spontaneous or induced abortions, may be as a result of cohabitation during advanced pregnancy, or a high level of female infanticide. It needs more detailed probing.

**Purchase of brides:** The practice of purchasing a bride was also quite common in the hills and throughout the central Punjab (including canal colonies) owing to the paucity of women. The practice was generally among the lower castes and classes. As with everything else which is subject to the law of supply and demand, the price of bride rose steadily with the rise in prices. In the middle of the nineteenth century, a bride could be had just for Rs. 59/- (Saini, 1975, p.63). In Rohtak, where the 1918 influenza carried off 10 per cent of the people, the price rose from Rs. 500 to Rs. 2,000. In Hissar, on the other hand, the prolonged drought of 1919-21 reduced it from Rs. 2,000 to Rs. 500. The bride price considerably varied with both tribe and religion. A Muhammadan, it seems, could generally get what he wanted for four or five hundred rupees, but the Sikh Jat had to pay one to two thousand probably because the shortage of girls was greater in that community (Darling, 1925, p.50).

The above description points to a paradox of the Indian society, particularly in the Punjab. While, on the one hand, there was a very substantial shortage of girls and women, on the other hand, there was female infanticide and neglect of the girl child and females at all ages.

### Economic factors

The Rajputs regards himself as an aristocrat. Proud of his birth and traditions, more accustomed to fight than to till, he is regarded as the worst cultivator in the Punjab. The Rajput's regard for his izzat forbids him to take any help from his wife. She can do nothing outside the house, and very little within. She cannot even draw water from the well, and, being a 'lady', must have servants to help her in all domestic tasks. The wife of the Jat or the Arain does almost as much as her husband, and sometimes more, but the wife of the Rajput is an economic burden. The Jat and the Arain go off to their fields at dawn and at ten o'clock their wives bring them their breakfast. The Rajput, on the other hand, must either employ a servant for the purpose, or stay at home till breakfast is finished (Darling, 1925, p.33). Although she does not plough, dig or drive a cart, there is no other form of agricultural labour that a Jat woman does not practice and ordinarily adorn (Darling, 1925, p.35). Thus, while a Rajput woman is an economic burden in true sense, this is not the case with the Jats. One then needs to explain as to why the sex ratio is extremely low among the Jats as well. Why there is the custom of polyandry and not polygamy? And, why the women are kept in very low esteem that they can even be murdered over a small pretext?

One may then conclude that the practice of female infanticide and neglect of girl child and women have been responsible for the low sex ratio in the Punjab. The low sex ratio at birth compared to other major provinces of the country during that period was, at least to some extent, a result of the female infanticide. One has still to find out if there was some thing biologically peculiar among the Punjabis to have a highly distorted sex ratio at birth since its value of around 900 can itself lead to an overall sex ratio of below 900 specially when there is neglect of females at all ages.



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## FERTILITY DIFFERENTIALS IN MADHYA PRADESH, INDIA

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The present paper explains the fertility differentials among socio-cultural groups and regions in the central Indian state of Madhya Pradesh and examines the role of such factors as general and female literacy, age at marriage and infant mortality in determining the fertility levels. The study indicates that no single factor is of overwhelming importance. These factors in combination, as revealed by multivariate analysis, account for about 29 percent inter-district variation in fertility in the state.

"There is no event in personal history more significant for the future than becoming a parent, and there is no pattern of behaviour more essential for societal survival than adequate fertility" (Ryder, 1972, 400). Human breeding is different from animal breeding. The former is not a simple biological process. As Bhende and Kanitkar (1983) remark, "within the biological limits of human fertility, several social, cultural, psychological, as well as economic and political factors are found to operate, and these are responsible for determining the levels and differentials of fertility."

Until 1981 census, there was no effort made to collect information on the number of children ever born as a measure of fertility. For the first time, the fertility tables, which were generated on the basis of computerised processing of 20 percent sample of individual slips, were published for 1981. These tables provide data for rural and urban populations separately but not for the total population.

The objective of the present study is to elucidate and explain the fertility differentials among socio-cultural groups and regions in Madhya Pradesh state of India. The data unless otherwise mentioned have been taken from Census of India, 1981, Series-11, Madhya Pradesh, Part VI : Fertility Tables. It may be noted that these data suffer from usual sampling error and hence be treated as estimates.

### Fertility Indices

Fertility refers to the occurrence of live births. For its measurement several indices are in vogue. These include crude birth rate, fertility ratio (child-woman ratio), general fertility rate, age-specific fertility rate, total fertility rate, etc. The crude birth rate (CBR) is the ratio of the number of live births in a year to the mid-year total population. The fraction is multiplied by 1000. The general fertility rate (GFR) is a better measure which is expressed in terms of number of live births

per 1000 women in the reproductive age-group or, as a modification, per 1000 married women. Fertility rates may be expressed specific for the age of married women (ASFR).

The total fertility rate (TFR) is an estimate of the number of children a cohort of 1000 women would bear if they all went through their reproductive years exposed to the age-specific fertility rates in effect at a particular time. It is calculated as follows:

$$TFR = \frac{\sum ASFR \times \text{age interval}}{1000}$$

"This rate (TFR) is generally regarded as the best single cross sectional measure of fertility, because it is rather closely restricted to the child-bearing population and is not influenced by differences in the age composition between child-bearing population. The total fertility rate is a standardised rate because it is referred to a constant base of 1000 women at each age group" (Bogue, 1969)

### Fertility Differences among Socio-Cultural Groups

Madhya Pradesh has very high fertility rate. In 1993, the estimated crude birth rate in the state was 34.9 which was the second highest among the CBR figures for the states of India (Sample Registration Bullentin, 1995). Within the state the fertility rates vary widely from one socio-cultural group to another and from one region to another. A glance at Table 1 reveals that all indices of fertility are higher for the rural population than for the urban population. GFR and TFR for the rural areas are 138 and 5.28. The respective rates for the urban areas are 130 and 4.52. Likewise there is found variation in fertility according to social groups, educational level, religion and work. Fertility is higher among the scheduled castes and lower among the scheduled tribes than among the general population. Among the

Table 1  
**Madhya Pradesh: Fertility Indices, 1981**

Populations	GFR		TFR	
	Rural	Urban	Rural	Urban
General	138	130	5.28	4.52
Scheduled Caste	142	138	5.60	4.79
Scheduled Tribe	129	138	4.92	4.50
Hindus	137	128	5.27	4.43
Muslims	172	147	6.47	5.27
Christians	123	101	4.87	4.00
Main Workers	130	105	4.90	4.02
Marginal Workers	153	149	5.70	5.60
Non-Workers	139	133	5.75	4.61
Illiterates	133	121	5.26	4.67
Below middle	178	138	5.25	4.48
Middle	212	149	5.11	4.03
Matriculates	212	144	4.71	4.01
Graduates	196	136	4.46	3.29

religious groups, the Muslims have the highest fertility and the Christians the lowest. Fertility among the working women is lower than among the non-working women.

As regards fertility among the married women of different educational levels, GFR and TFR exhibit different patterns. Increase in GFR from 133 among the illiterates to 212 among the matriculates presents a wrong picture which is against the established fact that there is an inverse relationship between the level of fertility and the level of educational attainment. The explanation of lower GFR among the illiterates lies in the difference between the distributional patterns of literates and illiterates and their fertility levels among the age groups. As compared to the literate married women, the illiterate married women are less concentrated in the highly fertile age group of below 30. Moreover, the illiterates are less fertile than the literates in this earlier part of the reproductive age. For example, in rural areas, the age group below 30 accounts for 43.80 percent of the total illiterate married women, vis-a-vis 66.74 percent of their literate

**AGE-SPECIFIC FERTILITY RATES**

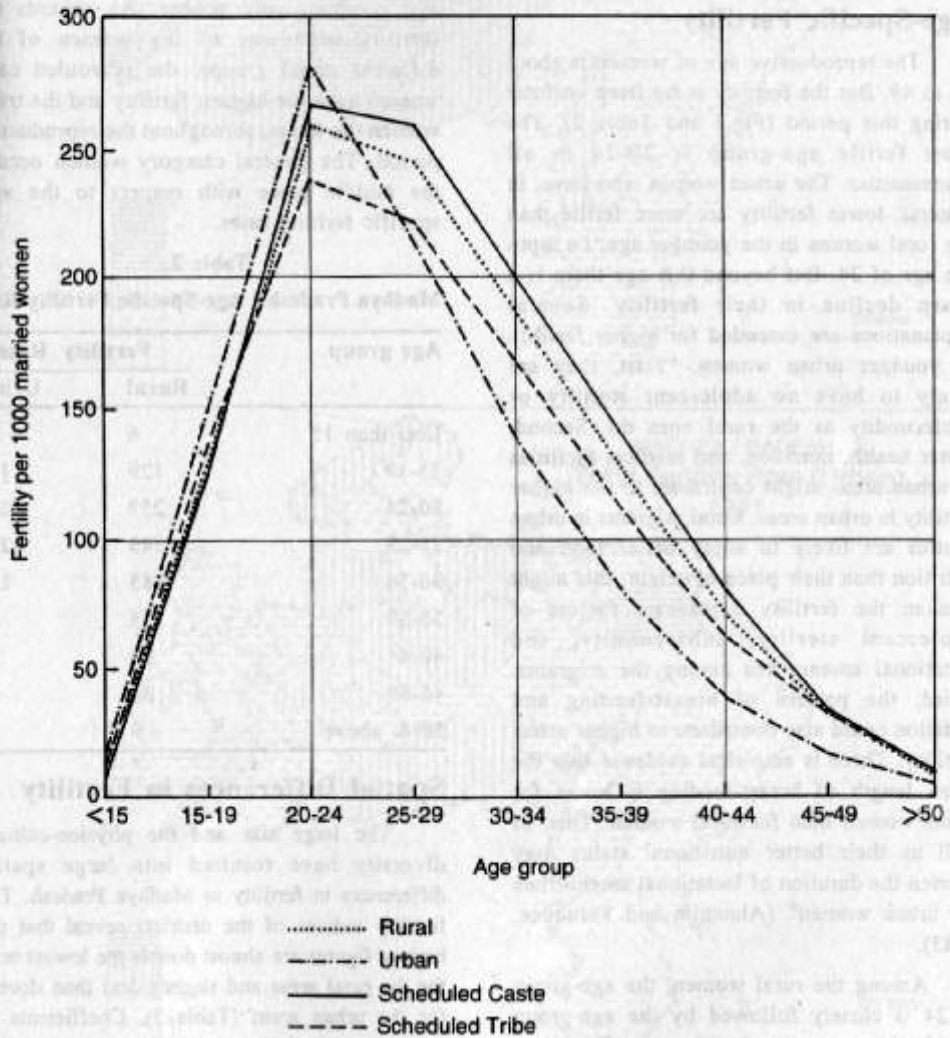


Fig.1

counterparts. The fertility rates of these two categories of women in this age group are 195 and 221 respectively. Thus the limitation of the technique is responsible for such type of result. However, TFRs, which are a more reliable index of fertility, indicate that the fertility decreases with the rise in education level.

### Age-Specific Fertility

The reproductive age of women is about 15 to 49. But the fertility is far from uniform during this period (Fig.1 and Table 2). The most fertile age-group is 20-24 in all communities. The urban women who have, in general, lower fertility are more fertile than the rural women in the younger age, i.e. upto the age of 24. But beyond this age there is a sharp decline in their fertility. Several explanations are extended for higher fertility of younger urban women. "First, they are likely to have no adolescent sterility or subfecundity as the rural ones do. Second, better health, nutrition, and medical facilities in urban areas might contribute to the higher fertility in urban areas. Rural migrants in urban centres are likely to enjoy better food and nutrition than their place of origin; this might weaken the fertility depressant factors of adolescent sterility, subfecundity, and lactational amenorrhea among the migrants. Third, the pattern of breast-feeding and lactation could also contribute to higher urban fertility. There is empirical evidence that the mean length of breast-feeding is lower for urban women than for rural women. This, as well as their better nutritional status may shorten the duration of lactational amenorrhea for urban women" (Alauddin and Faruquee, 1983).

Among the rural women, the age-group 20-24 is closely followed by the age-group 25-29 with respect to fertility rate. The sharp

decline sets in beyond 29. Thus the rural women have longer duration of high fertility. The shorter duration of high fertility among the urban women is mainly due to the fact that because of higher level of education and awareness and more accessibility to health and family planning facilities they want less number of children and leave the high fertility age comparatively sooner. As regards the fertility behaviour of the women of the different social groups, the scheduled caste women have the highest fertility and the tribal women the lowest throughout the reproductive period. The general category women occupy the middle place with respect to the age-specific fertility rates.

Table 2.

#### Madhya Pradesh : Age-Specific Fertility Rate

Age group	Fertility Rate	
	Rural	Urban
Less than 15	6	12
15-19	129	150
20-24	259	281
25-29	243	213
30-34	185	137
35-39	125	80
40-44	70	39
45-49	31	17
50 & above	9	6

### Spatial Differences in Fertility

The large size and the physico-cultural diversity have resulted into large spatial differences in fertility in Madhya Pradesh. The fertility indices of the districts reveal that the highest figures are almost double the lowest ones for the rural areas and slightly less than double for the urban areas (Table 3). Coefficients of inter-district variation also indicate that there is a

Fig.2

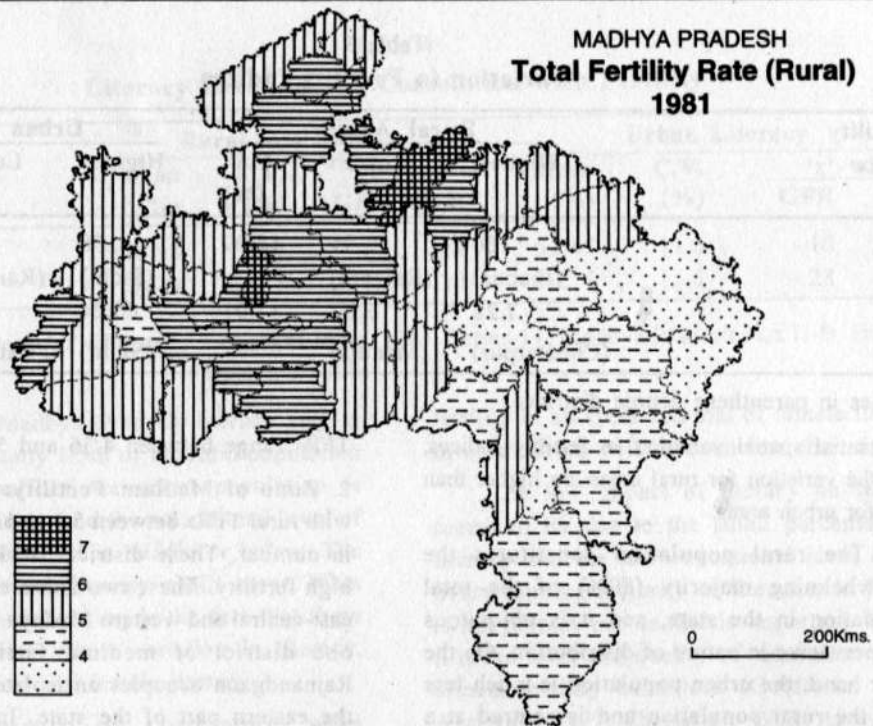


Fig.3

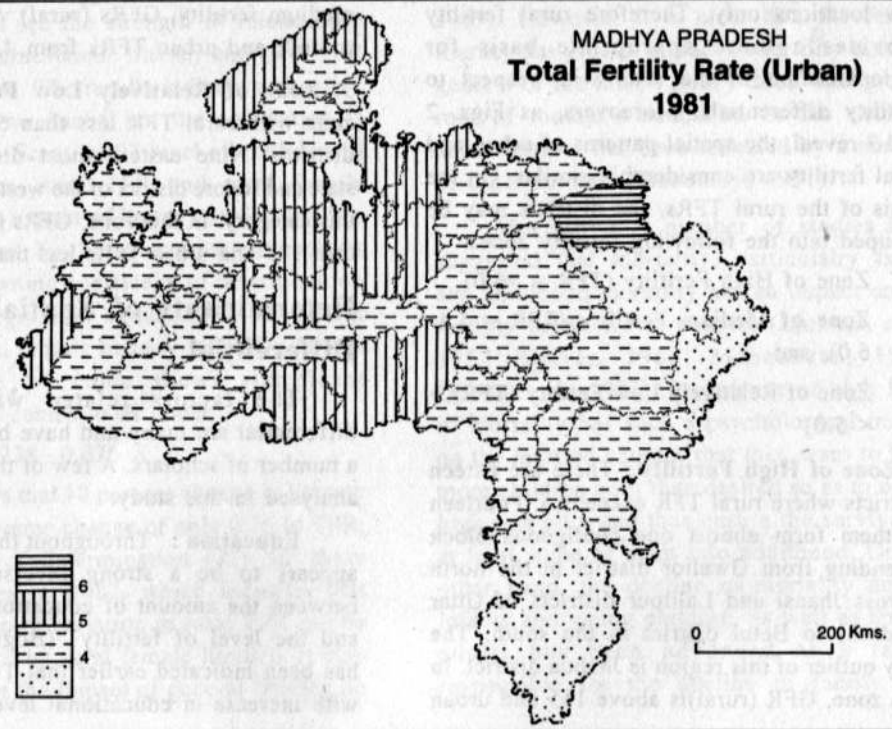


Table 3  
Variation in Fertility Indices

Fertility Index	Rural Areas			Urban Areas		
	Highest	Lowest	C.V. (%)	Highest	Lowest	C.V. (%)
GFR	180 (Jhabua)	91 (Raigarh)	16.09	188 (Sidhi)	104 (Raigarh)	13.76
TFR	7.28 (Chhatarpur)	3.63 (Mandla)	17.01	6.24 (Sidhi)	3.54 (Raigarh)	12.86

Names in parentheses denote districts

substantial spatial variation in fertility indices, and the variation for rural areas are higher than that for urban areas.

The rural population constitutes the overwhelming majority (80%) of the total population in the state, and it is ubiquitous and pervasive in nature of distribution. On the other hand, the urban population is much less than the rural population and is centred at a few locations only. Therefore rural fertility provides a more appropriate basis for regionalisation of the state with respect to fertility differentials. Moreover, as Figs. 2 and 3 reveal, the spatial patterns of urban and rural fertility are considerably similar. On the basis of the rural TFRs, the districts may be grouped into the following fertility zones:

- (1) Zone of High Fertility (TFR = >6.0),
- (2) Zone of Medium Fertility (TFR = 5.1-6.0), and
- (3) Zone of Relatively Low Fertility (TFR) = < 5.0)

**1. Zone of High Fertility:** There are fifteen districts where rural TFR exceeds 6. Fourteen of them form almost one contiguous block extending from Gwalior district in the north (across Jhansi and Lalitpur districts of Uttar Pradesh) to Betul district in the south. The only outlier of this region is Jhabua district. In this zone, GFR (rural) is above 155 and urban

TFRs range between 4.36 and 5.90.

**2. Zone of Medium Fertility:** The districts with rural TFRs between 5.1 and 6.0 are twenty in number. These districts flank the zone of high fertility. These two zones encompass the east-central and western Madhya Pradesh. Only one district of medium fertility, namely Rajnandgaon occupies an isolated location in the eastern part of the state. In the zone of medium fertility, GFRs (rural) vary from 120 to 160, and urban TFRs from 4.02 to 6.24.

**3. Zone of Relatively Low Fertility:** The zone with rural TFR less than 5 includes ten districts. Nine eastern most districts of the state and Indore district of the western part fall in this category. In this zone, GFRs (rural) are less than 123 and urban TFRs less than 4.87.

### Determinants of Spatial Fertility Differential

The factors related with fertility differential are many and have been listed by a number of scholars. A few of them have been analysed in this study.

**Education:** "Throughout the world there appears to be a strong inverse correlation between the amount of educational attainment and the level of fertility" (Bogue, 1969). It has been indicated earlier that TFR decreases with increase in educational level of married

Table 4  
Literacy Level and its Correlation with Fertility

Literacy	Rural Literacy				Urban Literacy			
	Mean (%)	C.V. (%)	'r' with		Mean (%)	C.V. (%)	'r' with	
			GFR	TFR			GFR	TFR
General	20.98	24.7	-.12	-.22	51.45	11.6	-.10	-.16
Female	8.74	41.5	-.18	-.30	39.74	15.6	-.28	-.28

*Source of Data for Literacy:* Census of India, 1981, Series-11, Madhya Pradesh Part II-B, Primary Census Abstract.

women. In Madhya Pradesh literacy rate is quite low as only 1/5th of the rural population and about half of the urban population is literate (Table 4), and the educational level of most of the literates is middle or below. The situation of female literacy is still worse. What is even more distressing is the fact that there is a wide inter-district variation in literacy, mainly in rural and female literacy.

Coefficients of correlation were calculated to see the strength of relationship between general/female literacy and GFR/TFR in the districts. The results indicate a negative relationship no doubt, but the correlation is low and significant (at.05 level of confidence) only between rural TFR and rural female literacy. The impact of literacy on fertility has been assessed by linear regression analysis and by computing coefficient of determination ( $R^2$ ). The regression equation for rural TFR (Y) and rural female literacy rate (X), only in which case 'r' value shows significant relationship, comes to as under

$$Y = 6.228 - 0.076 X$$

It shows that 10 percent change in literacy causes an inverse change of only 0.76 in TFR. Coefficient of determination ( $R^2$ ) for these two variables is 0.082, which indicates that only 8.2 percent variation in rural TFR can be accounted for by rural female literacy. It may be noted that the impact of general literacy on

fertility in all areas and that of female literacy in urban areas will be even less than this.

The low impact of literacy on fertility seems to be due to the small percentage of literacy and the low educational level of the overwhelming majority of literates. In fact, it is not literacy *per se* that is important. Rather it is the level and quality of education which affects fertility behaviour (Goldstein, 1972; Agarwala, 1977; Chatterjee, 1979; Ainsworth, 1989). However, it is clear that the female literacy has greater impact on fertility than the general or the male literacy does. The greater role of mother's education in the decision about fertility has been revealed by a number of other studies (Chaudhury, 1971).

**Mortality:** A number of studies have suggested that mortality, particularly infant and childhood mortality has an impact on the fertility behaviour of couples (Lorimer, et al. 1954; Driver, 1963; Mahadevan, 1979; Omran, et al., 1981). Prevalence of high level of mortality has such a psychological impact on the married couples that they want to have more children born than desired so as to offset high mortality and thus ensure the survival of at least some of them into adulthood. On the other hand, the decline in mortality among infants and young children, as well as among adults has been advanced as a factor responsible for the decline in family size



(Stanford, 1972).

In Madhya Pradesh, the infant mortality rate is 159 per thousand live births with a inter-district CV of 15.9 percent for rural areas and 108 with a CV of 25.5 percent for urban areas. Table 5 shows that the correlation between infant mortality and fertility is positive but low (not significant even at 0.05 level of confidence). Only rural infant mortality is correlated with rural TFR at 0.1 level (a low level) of significance.

Table 5

**Infant Mortality and its Correlation with Fertility**

Area	Infant Mortality			
	Rate	C.V.	'r' with	
			GFR	TFR
Rural	158.98	15.9	+0.22	+0.28
Urban	108.20	25.5	+0.17	+0.18

*Source of Infant Mortality Data* : Census of India, occasional Papers No.5 of 1988, Child Mortality Estimates of India

The regression equation for rural infant mortality (X) and TFR (Y) which is  $Y = 3.909 + .010X$ , shows that a change of 10 units in infant mortality causes a change of only 0.1 in TFR in rural areas. Coefficient of determination of 0.076 indicates that only 7.6 percent variation in rural TFR is accounted for by infant mortality.

However, if the percentage of the number of deaths among the children ever born to the number of women ever married is correlated with GFR/TFR, the coefficients come to as given in Table 6.

The coefficients indicate significant correlation at .05 level of confidence in case of the rural population and at .01 level of confidence in case of the urban population.

**Age at Marriage** : Early age at marriage increases the span of reproductive period of

Table 6

**Relationship between Mortality and Fertility**

Fertility Index	'r' with percent of No. of deaths of children ever born to No. of women ever married	
	Rural	Urban
	GFR	+0.31
TFR	+0.36	+0.59

women and thus may contribute to higher level of fertility. On the other hand, late marriages do not only reduce the effective duration of child bearing but also lead to better educational attainments, and more awareness about family planning and child care methods and thus to smaller families (Nayar, 1983). Out of the total rural married women of the state 61.05 percent were married before they attained the age of 15. The percentage of such married women varies from 29.8 in Jhabua district to 78.3 in Bhand district (CV=18.8%). The percentage of the early married women is, in general, lower in the eastern part and the tribal areas than in the north-western and north-central parts of the state (Fig.2). Coefficient of their correlation with GFR and TFR come to +0.34 and +0.33 respectively, which indicate positive correlation significant at .05 level of confidence. The regression equation for the early marriage percentages (X) and the rural TFR, which is  $Y = 3.848 + 0.028 X$ , reveals that 10 percent change in the early marriage leads to a change of 0.28 in TFR. Coefficient of determination (R<sup>2</sup>), 0.114, indicates that the contribution of this factor in the variation of rural TFR amounts to 11.4 percent.

**Combined Effect of Literacy, Early Marriage and Infant Mortality on Fertility**: Multivariate analysis was attempted to find out the combined effect of general and female

literacy, early marriage and infant mortality on fertility (TFR) among the rural population. The equation of multiple linear regression comes to:

$$Y = 3.40 - 0.026X(1) - 0.053X(2) + 0.031X(3) + 0.010X(4)$$

where Y = TFR

X(1) = female literacy rate

X(2) = total literacy rate

X(3) = percentage of the women married before 15, and

X(4) = infant mortality rate.

For measuring the proportion of variation in TFR accounted for by the total effect of the above cited four factors, the coefficient of multiple determination,  $R^2$ , was computed. The resultant  $R^2$  0.289 (F ratio = 3.249; df = 4,40) shows significant impact at .05 level of confidence (but not at .01 level of confidence). The coefficient also indicates that only 28.9 percent variation in TFRs may be accounted for by the combined effect of the four factors. It may be noted that combined  $R^2$  is slightly less than total of ' $R^2$ ' for individual factors.

## Conclusion

The above discussion reveals that there exists considerable variation in fertility among the different socio-cultural groups as well as the different regions. Fertility is higher in rural areas, but in the younger age, urban women have higher fertility. Lower level of fertility of the tribal women than their non-tribal sisters is worthy of mention. As regards spatial differences, the level of fertility is low in the eastern part, medium in the east-central part, high in the west-central part and again medium in the western part. The examination of such determinants of fertility differential as general and female literacy, infant mortality and age at marriage indicate that individually their role in determining fertility variation is quite limited and no single factor can be considered as to be of overwhelming significance. The multivariate analysis indicates that only about 29 percent variation in the rural fertility may be accounted for by the combined effect of these four factors. The impact of these factors is even less on the fertility in urban areas.

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## AGE PATTERNS OF FERTILITY IN MADHYA PRADESH

ALOK RANJAN

Datia, India

The purpose of this paper is to analyse age-patterns of fertility in Madhya Pradesh based on district level estimates of aggregate measures of fertility data collected in 1981. Since single year estimates of fertility are not available, the author has resorted to the use of 5 year age-specific fertility rates. For doing this analysis he has used Brass Relation Fertility Model. Before applying the model he has carried out a clustering exercise to group the districts according to the similarity in the age-specific fertility rates. Accordingly four clusters of districts have emerged which reveal a clear zonal pattern in age-specific fertility rates in the state. These groups bring out high fertility rates in the north and north-western parts of the state, gradually declining toward the south-eastern zone. The author suggests that separate policies and programmes be evolved for each of the clusters of districts for the purpose of bringing about reduction in fertility and promoting family welfare in the state of Madhya Pradesh.

### Introduction

District level estimates of aggregate measures of fertility obtained from children ever born data collected during the 1981 population census in Madhya Pradesh reveal considerable inter-district variations (Government of India, 1987). Like these aggregate measure, age pattern of fertility is also expected to vary widely across the state. However, there is little knowledge about age patterns of fertility in the state. In a recent study, the author has attempted to analyze the age pattern of fertility in the state on the basis of five year age specific fertility rates. But interpretations based on five year age specific fertility rates may often be misleading as nothing is known about the fertility pattern within the five year age group. But single year estimates of fertility are not available so far.

Problems like analysis of age pattern of fertility can be effectively dealt with the modelling of fertility schedules. A number of fertility models are available for the purpose. Henry (1961) was the first to discover that in populations where there is no or little voluntary control of fertility, age pattern of fertility within marriage is approximately constant and termed this fertility as natural fertility. Coale and Trussell (1974) by generalising natural fertility pattern proposed a model of fertility that was able to represent fertility experience of populations where voluntary control of fertility was exercised. Working in a different direction, Brass (1981) postulated a relational scheme between a 'standard' fertility schedule and any other fertility schedule. Brass discovered that by a suitable transformation, a linear relationship between 'standard' and observed fertility schedule can be established.

These standard fertility schedule have been developed separately by Brass and Booth (1984) on the basis of fertility experience in the developing countries.

The model suggested by Brass is definitely easier to use than the model suggested by Coale and Trussell. Though Brass model can be very useful for simulation as well as for projection purposes, the experience with its use is limited. In this paper, we apply the Brass model to analyze age pattern of fertility in the districts of Madhya Pradesh and discuss some of its policy implications in the context of fertility reduction in the state. Madhya Pradesh, it may be pointed out, is one of those states of the country where fertility levels continue to be unacceptably high and are a serious cause of concern to population and development experts at the national level.

## 2. Brass Relational Fertility Model

Brass relational fertility model is based on the cumulative proportional fertility and represents it as a linear transformation of a set 'standard' rates. The key to the model is a mathematical transformation that makes the relationship between the cumulative proportional fertility of an observed fertility schedule and that of a 'standard' almost linear. This transformation, well known in the literature as Gompertz transformation is defined as

$$G(p) = -\ln(-\ln(p)) \quad (1)$$

and its inverse is

$$u = \exp(-\exp(-p)) \quad (2)$$

where  $p$  is the cumulative proportional fertility in any age group and it denotes the natural logarithm. Thus if  $Y(x)$  denotes the Gompertz transformation of the cumulative proportional fertility at age  $x$  and  $s$  is the subscript used for the standard, then

$$Y(x) = a + b * Y_s(x) \quad (3)$$

where  $a$  and  $b$  are the parameters of the model. They have distinct interpretations. Parameter  $a$  indicates the central tendency of the fertility schedule while  $b$  represents its dispersion or spread relative to the standard for which  $a=0$  and  $b=1$ . A value of  $a < 0$  indicates a relative shift in the central tendency of the fertility schedule towards the right while  $a > 0$  indicates the opposite as compared to the standard. Similarly,  $b < 1$  indicates a flattened or platykurtic fertility curve while  $b > 1$  indicates a peaked or leptokurtic fertility curve relative to the standard. Thus the two parameters, in combination determine the shape of the fertility curve almost in a similar manner in which arithmetic mean and standard deviation determine the shape of a 'normal' of Gaussian distribution. The essential difference is that the parameters  $a$  and  $b$  are relational relative to the standard fertility schedule used in the analysis. If this standard fertility schedule is changed, values of the parameters  $a$  and  $b$  will obviously change.

## 3. Data Source

The present analysis utilises the estimates of age specific fertility obtained by the Registrar General of India on the basis of the information on children ever born collected during the 1981 population census (Government of India, 1987). These estimates, however, were not corrected by the P/F ratio technique suggested by Brass. As such, the estimates available from the Registrar General were first adjusted through P/F ratio method so as to make them compatible with the adjusted estimates of total fertility rate prepared by the Registrar General. The adjustment process was simple and crude. We estimated a correction factor that was equal to the ratio of the adjusted and unadjusted total fertility rates for each of the 45 district with the

corresponding correction factor. In other words we have assumed that the correction process is not age selective.

The standard used in this analysis has been taken from Booth (1984). This pattern has been designed to represent the typical fertility pattern in high fertility population. For low fertility populations, use of a different standard has been suggested (Newell, 1988).

#### 4. Age Pattern of Fertility

Before applying the Brass Relational Model, we carried out a clustering exercise to group the districts according to the similarity in the age specific fertility rates. Such an exercise was deemed necessary because of two counts. First, a similarity in five years age specific fertility schedules of a number of districts had been observed through a simple examination of the information available. Second, if all the 45 districts would have been retained for the analysis, we would be having 45 values of parameter *a* and 45 values of parameter *b* of the model. Making interpretations on the basis of 90 values of the parameters of the model would have been a difficult job.

For clustering the district, we applied a clustering algorithm available with SYSTAT statistical software package to age specific fertility rates of each of the 45 districts of the state. The Euclidean distance between the districts (observations) and the complete linkage method which minimised the distance of farthest neighbour in terms of age specific fertility rates of different districts were the criteria used for clustering.

Application of the clustering algorithm to our data set of 45 observations (districts) and 7 parameters (age groups) yielded the following four clusters:

**CLUSTER I:** Morena, Tikamgarh, Panna,

Chhatarpur, Vidisha, Sagar, Raisen, Jabua, Shivpuri, Bhind, Sehore, Datia, Damoh, Betul

**CLUSTER II:** Satna, Hoshangabad, West Nimar, East Nimar, Dhar, Rewa, Gwalior, Sidhi, Shajapur, Rajgarh.

**CLUSTER III:** Chhindwara, Narsimhapur, Jabalpur, Dewas, Mandasaur, Ratlam, Ujjain, Bhopal

**CLUSTER IV:** Balaghat, Seoni, Rajnandgaon, Shahdol, Bilaspur, Raipur, Indore, Mandla, Durg, Raigarh, Surguja, Bastar.

The cluster pattern identified through the analysis reveals some clear geographic pattern in age specific fertility rates in the state. All but two districts of cluster I are located in the north and north-western part of the state. Similarly, all but one district of cluster IV are located in the south-eastern part of the state. On the other hand, in cluster III and IV, two distinct groups can be identified. In case of cluster II, there are six districts in one group-Rajgarh, Shajapur, Dhar, East Nimar, West Nimar and Hoshangabad-all located in the west and south western part of the state. The second group of districts in this cluster is located in the extreme north-east of the state-Rewa, Sidhi, and Satna. Similarly, one group in cluster III is located in central part of the state-Jabalpur, Narsimhapur and Chhindwara while the other group is located in the western part of the state-Dewas, Ujjain, Ratlam and Mandasaur.

Table 1 shows the unweighted averages of selected fertility indicators for each of the four clusters identified above. It is clear that as one moves from the north-western part of the state to its south-eastern part, or from cluster I to cluster IV, fertility levels decrease. This decrease in fertility is also associated

Table 1  
Selected fertility related indicators in different clusters.

Indicators	Cluster I	Cluster II	Cluster III	Cluster IV
CBR	42.45	39.83	37.33	34.90
TFR	6.41	5.83	5.31	4.61
GFR	196.53	179.00	167.25	144.75
Median age at marriage	14.95	14.90	15.24	15.53
Proportion of females 15-19 married (%)	73.64	60.73	59.51	44.03

with a changing pattern in nuptiality indicators included in the table indicating that marriage pattern also play some significant role in deciding inter-district variations in fertility in the state.

Once clusters were identified, average five year age specific fertility rates were calculated for each of the four clusters and the model was fitted separately for each cluster. Orthogonal regression has been used to estimate the parameters of the model. Orthogonal regression treats the observed and standard fertility schedules symmetrically. It can be shown that the slope of orthogonal regression is the geometric mean of the two slopes resulting from the vertical and horizontal deviations (Chaurasia, 1983).

In case of orthogonal regression, parameters  $a$  and  $b$  are estimated by

$$b = S_o/S_s \text{ and } a = Y_o - b \cdot Y_s$$

where  $s$  denotes the standard deviation and subscripts  $o$  and  $s$  stand for observed and standard fertility schedules.

Estimates of parameters of the model for each of the four clusters are presented in Table 2. As one moves from cluster I to IV, values of the parameters tend to increase. This indicates that as one moves from cluster I to cluster IV, the shape of the fertility curve changes from a near normal platykurtic curve to a skewed to the left leptokurtic curve. If we divide the reproductive span into two parts, then this means that as we move from cluster I to cluster IV, more and more births tend to concentrate in the first half of the reproductive span. On the other hand, values of parameter  $b$  suggest an extended pattern of fertility in cluster I and a somewhat contracted pattern in cluster IV indicating curtailment of fertility in the later ages of reproductive period in this cluster. Lowest

Table 2  
Estimates of parameters of Gompertz relational model

Parameter	Cluster I	Cluster II	Cluster III	Cluster IV
'a'	-0.1093	-0.0710	-0.0978	0.0346
'b'	0.7857	0.7943	0.8270	0.8210

values of parameters of the model have been obtained for cluster I while the highest value of parameter  $a$  has been obtained in cluster IV while that for parameter  $b$  has been obtained for cluster III.

The pattern of change in the parameters of fertility model fitted here appears to be consistent with the level of fertility in different clusters. It is well known that when fertility declines, it tends to concentrate in ages around 25 to 30 years. On the other hand, in near natural fertility conditions, a substantial proportion of births takes place at the later ages of the reproductive span resulting in an extended fertility pattern.

The estimates of the parameters of the model can be used to generate single year fertility rates for each of the four clusters. These single year fertility rates have been plotted in fig. 1 and Fig. 2 separately for each cluster. These figures bring out, very clearly, widely different age pattern of fertility in different parts of the state.

By way of comparison, we have also calculated the ratio

$$r(x) = cf(x)/fs(x) - 1 \quad (4)$$

where  $f(x)$  denotes the fertility at age  $x$ . Here we have not taken the Brass or Booth standard fertility schedule but have opted the fertility schedule of cluster IV as standard. The purpose of this comparison is to identify the pattern of deviation of fertility schedules of clusters. Deviation is generally sought from as average & not a extreme case. I, II and III from the fertility schedule of Cluster IV-the cluster with lowest level of fertility. Values of  $r(x)$  for each of the first three clusters are plotted in figure 5 which indicates interesting variation in the age pattern of fertility in clusters I, II and III as compared to cluster IV. The pattern

obtained in clusters I and II is more or less similar but the pattern obtained in case of cluster III is altogether different.

For the sake of comparison, we have divided the whole reproductive span into two broad age group-below 25 years and above 25 years. In the age group below 25 years, fertility is highest in cluster IV as compared to other clusters resulting in negative values for ratio  $r(x)$ . But in the age group above 25 years, the pattern is reversed. Moreover, in case of clusters I and II, the pattern is almost a reversed S type curve. But in Cluster III, the ratio  $r(x)$  does not increase with the increase in  $x$  but tends to flatten at the older ages of the reproductive life span. At the same time,  $r(x)$  is extremely low at younger ages in this cluster.

## 5. Policy Implications

Implications of the foregoing analysis can be categorised into two groups as far as population policy for the state is concerned. These groups are broad policy framework and the effectiveness of family planning in reducing fertility in different districts of the state. The policy perspective of population control in the state shall be discussed afterwards.

Indian programme to reduce fertility may be termed as a unique programme as it has focused almost entirely upon limiting births rather than on spacing births. An implication of such an approach is that fertility must reduce drastically in the older ages of the reproductive period when the desired family size is achieved and unwanted pregnancies are successfully prevented through the programme. But it is clear from the analysis that the programme has apparently failed to check fertility in the older ages of the reproductive period in districts of cluster



Fig. 1

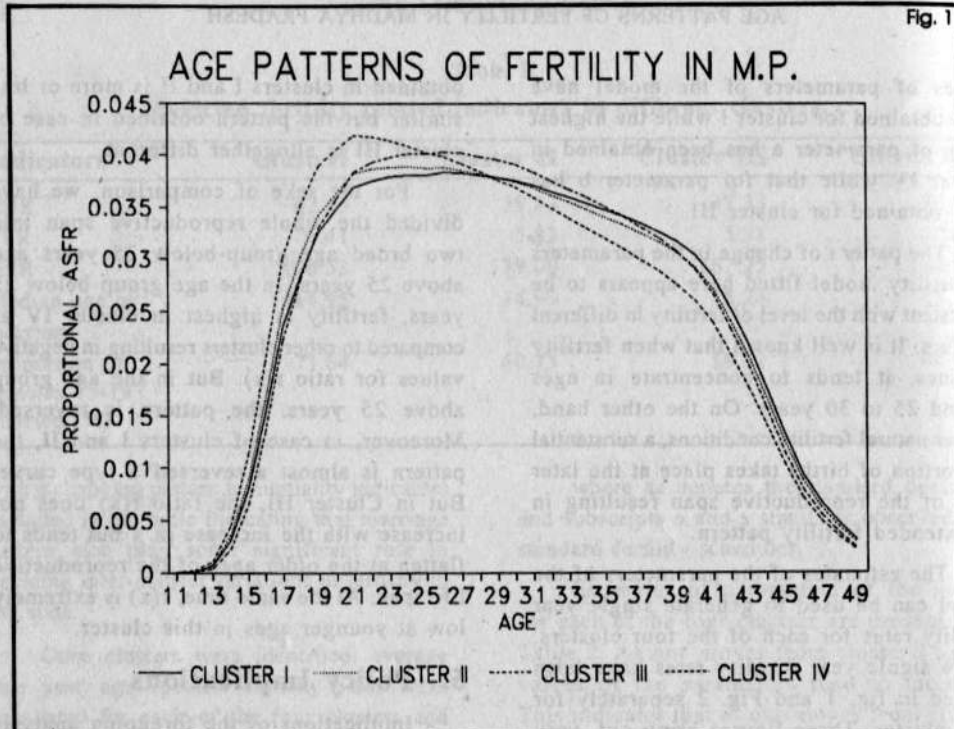
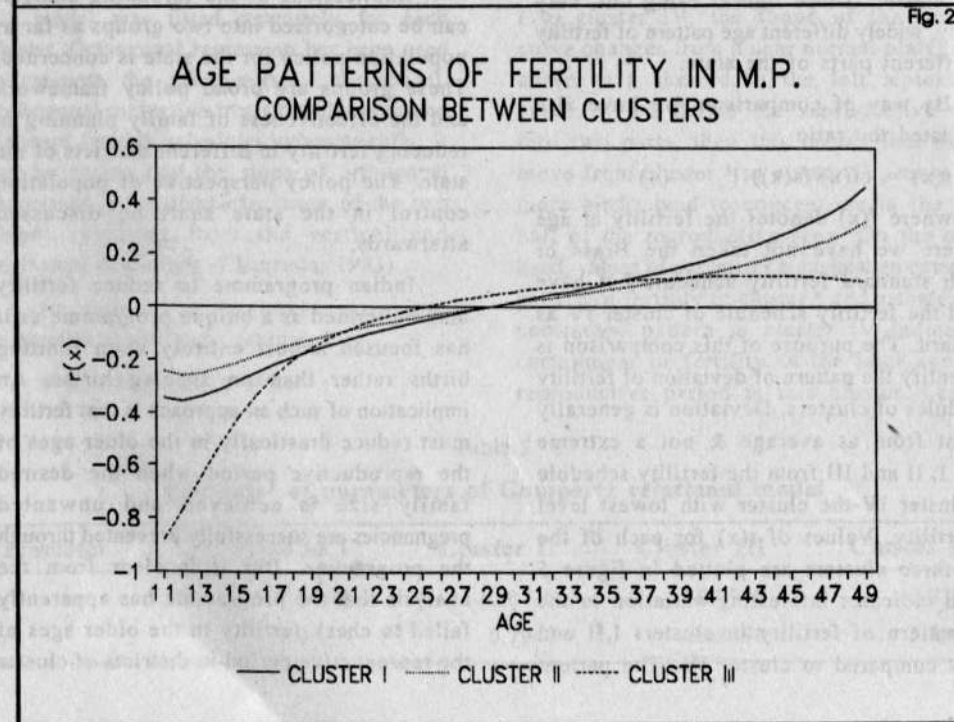


Fig. 2



I and cluster II. The family welfare programme service statistics show thousands of sterilizations done in these districts under the programme but the impact of these sterilisations is not at all visible on the age pattern of fertility. By contrast, a moderate decline in fertility after 30 years of age in cluster IV clearly shows the impact of the programme in districts included in this cluster. It is not clear why the programme has been able to prevent higher order births in one part of the state but failed to do the same in the other part. Such an analysis requires measurement of both programme efforts as well as social and economic environment and their impact on the programme performance.

As far as the broader policy perspective is concerned, the analysis suggests that the state should be divided into at least four zones and in each zone, a separate policy and strategy for reducing fertility should be evolved by taking into consideration the age pattern of fertility as revealed through the present analysis as well as the levels of fertility at aggregate level. Thus throughout the northern part of the state as well as in some districts in the south-western part, efforts should be focused on preventing higher order births simultaneously with efforts for birth spacing. In the districts of cluster IV, on the other hand, efforts under the programme should be concentrated on spacing between births. Similarly, an appropriate strategy may also be adopted for districts included in cluster III.

#### 4. Conclusions

Using the Brass Relational fertility Model, the present analysis shows that at least four fertility regimes are prevalent across the districts of Madhya Pradesh. These fertility regimes are characterised by extended fertility regime in the north and north-western part of the state and its gradual contraction as one moves towards the south-eastern part. These findings are in conformity with the state level analysis for the country as a whole in which it has been observed that the centre of high fertility in India lies in the Gangaic plain and as one moves away from this plain in any direction, fertility levels decrease (Chaurasia, 1991).

The analysis presented here highlights the need of dividing the state into at least four zones and evolving separate policies and programmes for each zone separately as far as fertility reduction is concerned. The analysis also points out differential effectiveness of the family welfare programme in the state and stresses the need for a detailed district level analysis of the factors responsible for this differential effectiveness of the family welfare programme.

The analysis is based on the graduation of five year age specific fertility rates into single year age specific fertility rates through the fertility model proposed by Brass. The approach is based on the assumption that the reported fertility rate is the true fertility rate. It is however difficult to ascertain this fact.

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## BOOK REVIEWS

**KUTTAN MAHADEVAN AND PARAMESHWARA KRISHNAN (EDS.):  
METHODOLOGY FOR POPULATION STUDIES AND DEVELOPMENT**

Sage Publications, India, New Delhi, 1993.

Price Rs. 375/-.

*Reviewed by Swarnjit Mehta*

Scholars working in population studies, irrespective of their disciplinary affiliations, have to learn much from each other in order to sharpen their methodological tools and enrich their conceptual frameworks. This, undoubtedly has become all the more important in view of the interdisciplinary nature of various dimensions of population. The credit for making the present edited volume available for reference, and thus fulfilling a major requirement, goes to Kuttan. Mahadevan and Parameshwara Krishnan. The two scholars are eminently known and recognised within India and outside because of their seminal contribution to sociology in general and demography in particular.

At the outset the editors have to be complemented for coherently organising the volume, for inviting scholars from other disciplines to contribute chapters, for including some of their own and their doctoral scholar's contributions to this volume. It is a kind of reference volume which every student of population must stack in his/her personal library and refer to it in times of methodological confusion and doubt.

But for one chapter (15) all the chapters in the volume relate to population studies. The

book is divided into six parts, each part having a focal theme to which the individual chapters are devoted. Part I brings out the importance of theory and research design in population studies. Hunert M. Blalock Jr., an established social science methodologist, emphasises the importance of research design. Critically reviewing the methodological literature on research design, he duly cautions against the hidden assumptions in our designs which have a bearing on our interpretations. Conceptual models in population research have been ably discussed by K. Mahadevan in chapter 2. He has included his earlier studies on fertility-contraceptive behaviour, fertility-cum-status of women, decision-making in fertility control policies, family planning, diffusion of innovation, communication and contraceptives. Evidently there is a lot of self-citation, but that only substantiates that Mahadevan is wholly basing himself on his empirical studies which by now are quite familiar for students of population studies. Despite some limitations of operationalisation, most of his conceptual models including the popular Life Affecting Variables (LAVs)' are useful tools for analysis. Elaborating on the multivariate analysis of demographic data Jayachandran reviews the notion of causality and highlights the tentative nature of causal explanations.

Part II of this edited volume covers methodologies of some major social science disciplines which, among other themes, also study population. J. Dennis Willigan, an expert scholar of historical demography, has probed various facets of methodologies for analysing

life histories. Willigan reviews three important studies on social mobility and concludes that most data on life histories suffer from limitations and do not permit formulation of explanatory theories. P. Krishnan and his doctoral student A.K.M. Nurun Nabi critically examine some of the popular approaches adopted in the study of human migration. They identify the problem areas in this theme. Written largely in the style of a textbook, these authors conclude that there cannot be overarching general theories and that there is a need for region/subregion specific models for some meaningful migration studies. The nature of population research in sociology forms the backdrop of K. Mahadevan, R. Jayasree and S. Anarajus' article wherein they focus on fertility research. The trio strongly urge the need for placing fertility studies in the context of structural changes in society which impinge on fertility behaviour. They have also discussed various sociological aspects of family planning including the basics of population education. The need for incorporating the psychological parameters in studying population decisions has been emphasized by Varda D. Thompson and Abbas Tashakkori. The duo-former a social psychologist and the latter specializing in education, explore the various dimensions of decision making as a process, in particular the national and normative influences on this process in the context of attitudinal models. They have appropriately cited examples of action models for contraception use and have pleaded for not minimizing the import of individual differences in our enthusiasm for evolving general models.

Leszek A. Kosinski and Feroz Kurji acquaint the readers with the geographic approach to the study of population. It is indeed a matter of pride for the Association of Population Geographers, India (APGI) that the authors have duly appreciated Population Geography the journal of APGI. as "the only specialised periodical in population geography published since 1979 in India". The major

orientations of population geographers which include: spatial patterns of demographic processes, mobility/migration, population distribution and redistribution, population and resources, population mapping etc. etc. which have interested the population geographers more than the others have been discussed in this paper. However, the methodologies adopted by geographers have not been subjected to any critical and objective investigation by the authors. This would be viewed as a serious gap in this paper especially by non-geographers who would have liked to know more about the distinctiveness of a geographic perspective on population.

An extremely refreshing paper is by three Chinese scholars: Jingyan Yu, Chi-hsien Tuan and Guanghan Zhu. It traces the evolution and emergence of systems science in China for the study of population problems. Among other factors, the comparative success of the Chinese population policy may be attributed to the active involvement of academics in the governmental programmes. The three scholars lucidly explain the methodology for modelling the population systems, their stability, projections into the future, observability and controllability. Theirs appears to be a truly scientific approach to understanding of population.

'Mathematics and Population Research' is the theme of P. Krishnan's paper. He rightly cautions against thoughtless application of mathematics without understanding the theoretical dimensions of various population attributes. Krishnan's advice to the mathematically oriented analysts of population is to treat mathematics not as a 'Queen' but as 'servant' of sciences. Krishnan reviews the various deterministic models of population growth, mortality, fertility and migration and concludes by placing theory ahead of mathematics as a passion.

The methodological aspects of epidemiology-which studies the distribution and determinants of disease in human population have been analysed by Lory M.

Laing. Epidemiologic methods address specific questions relating to diseases which form a crucial input for decisions regarding priorities in health care which also have a strong bearing on the effectiveness of different interventions.

The importance of micro level studies as inputs in the formulation of population policy has been brought out well in 'Anthropology and Population Studies' by Raghuvir D. Sharma, Anil Kumar Koshy, Ms. R Murthy and N. Viswanathan. Their study, essentially a review of anthropological perspective on fertility, mortality, status of women, etc. cautions population scholars against the tendency of regarding races in any hierarchical manner.

The continuing obsession with mathematization of demography is reflected in 'Loglinear Models for Quantitative Dependent Variables' by Alfred De Maris and K.V. Rao. In the similar vein is N.M. Lalu's paper on 'A Computer Programme for macro-simulation in Demography'. Using data for Nepal the author has developed a model for population projection. The concluding paper in the section of interdisciplinary methodologies in population studies focuses on the theme of development. K. Mahadevan, Baha Abu Laban, Sharon McIrvine, Abu-Laban and M. Sumangala develop a holistic model for the third world countries. The authors present a critique of various (also much familiar) economic, sociological, political-economic models and indicate their limitations when applied to the third world context. Their proposed model is weighted in favor of social-development parameters and is based on sound and logical assumptions about the economy and society of developing countries. This is one singular paper in the present volume which justifies the inclusion of 'Development' in the title of the volume which otherwise is almost exclusively devoted to population. This paper not only breaks monotony but also warns scholars against looking at population in isolation from the economic, cultural and political context.

Part IV takes us back to the most favourite areas of demographers: projection and estimation. M.V. George and J. Perreault elaborate on the methodology of projecting households and families by the 'Headship rate Method'. Factors of household growth are discussed and various projection approaches are reviewed for selecting the most appropriate approach for the study area: Canada. The second paper in this section examines the strategies for dealing with various uncertainties involved in estimating survivorship in the higher age-group. Charles J. Mode and Herman E. Gollwitzer present a commentary on the limitations including inconsistencies in census data as also death-registration data and propose an expanded strategy for dealing with the same. How far the strategy would succeed in helping researchers for extrapolation of data would depend on its application in different contexts.

Section V titled 'Action Research' includes K. Mahadevan's findings of too familiar empirical studies arranged in two separate papers. In one Mahadevan has reiterated his design of action research based on the principle of diffusion through 'satisfied adopters'. In the second paper he presents a methodology for evolving population education programmes, the prerequisites in the procedure and the conditions required for the success of a programme. Both the papers together, however, may fail to convince the readers that there is close interdependence between 'academic' and 'action' research'. At best this volume presents a laboured exercise in this direction.

Most readers may also not agree with the editors for making a separate section (VI) to cover the select research contributions of Professor N. Krishnan Namoboodiri to whom this volume is dedicated. A commentary on his contributions which cover a vast range, both temporal and thematic, could have formed a part of the preface. In the present format this appears to be hanging loosely towards the fog

end of the Volume. It would have been more appropriate to place it right in the beginning.

Sage publications indeed are keeping up their commitment to publishing quality social science. The present volume is also reasonably priced and this factor, apart from the quantity and quality of material which it contains, should go a long way in enhancing its accessibility to students researchers and teachers in social science disciplines.

**AIJAZUDDIN AHMAD : MUSLIMS IN INDIA  
VOL. I BIHAR VOL. II RAJASTHAN**

Inter India Publications, New Delhi, 1993 & 1994  
Price Rs. 600/- and Rs. 480/-

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*Reviewed by Swarnjit Mehta*

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With the first two volumes of Muslims in India Aijazuddin Ahmad has introduced the readers to his megaproject which he launched in 1990. Ahmad's ambitious project proposes to cover the culturally diverse regions of India and aims at producing reports based on intensive field surveys in two series. State series which would cover the rural and urban segments of each region separately and the thematic series which would focus on crucial characteristics such as fertility, age-structure, sex ratio, age specific literacy and educational levels of Muslims in relation to Hindus and other communities in inter-regional comparisons. Further, the project proposes to have a complete coverage through household surveys of 6 towns, one each in West Bengal, Bihar, Uttar Pradesh and Rajasthan, two in Madhya Pradesh; Firozpur Jhirka tehsils (all blocks) of Haryana; two in Uttar Pradesh, a cluster of villages in Tamil Nadu and one village in Pondicherry. A survey of sample household only has been done in Delhi, Madras, Calcutta, Zamania and Firozabad towns in Uttar Pradesh and Gulbarga town in Karnataka. The two volumes under review are based on complete survey of Kishanganj town to capture the situation in Bihar and Didwana to represent Rajasthan. Being a part of a big and ongoing project and organised in a uniform

framework both the volumes can be reviewed together.

The volumes follow a well-conceived and coherent structure. They carry a detailed general introduction to the project, introduction to the volume besides lists of tables, figures and appendices. Each volume is arranged in two sections: Section One is titled Report and Section Two carries three appendices containing tables based on: (i) Census of India, 1991; (ii) Field Survey; and (iii) The questionnaire used in the field survey. Section I in both the volumes constitute the main report divided into seven thematic units: Background which gives a view of Muslims and their distribution in the State, educational infrastructure of the State, relationship between the distribution of Muslims and the spread of literacy; Social structure which includes a discussion of the religious composition of the population in the study area household size, age of the head of the household, linguistic composition, and religious and language declaration. Demographic Structure covers sex composition and marital status; structure of the workforce looks at the participation rates in the economic activity and sectoral structure and distribution of workers by industrial categories. A complete unit is devoted to literacy and educational levels which also incorporates details on medium of instruction, expenditure on education as also the issue of drop-outs. This is followed by a unit devoted to education-employment linkage. The report sums up the main conclusions in each volume. The exhaustive format has indeed allowed the author to logically arrange the massive data collected at micro level.

Ahmad conceived the project basically to "highlight the state of Muslim society in the context of the general conditions affecting them as well as other communities in a comparative frame." He rejects outrightly approaching Muslims as a social isolate and wanted to examine the various dimensions of the community as a response to an established historical tradition in which they evolved and

also the various distortions introduced during the post-Independence period through mechanisms which are definitely "discriminatory to certain sections of the Indian socie. including Muslims. In view of the paucity of the prevailing data base for any meaningful inter community comparison, Ahmad's project is indeed a pioneer effort. His assumptions are sound and are based on his long innings as a creative social and historical geographer. He has looked at the Muslim community in India as an integral part of Indian ethos but also as a community which has witnessed conspicuous marginalisation in Indian society.

Though the publication plan of the project is to produce a series of volumes each focussing on a specific region/state, Ahmad has done well in placing each region/state in the all-India context. In his methodology one can easily discern his ability to integrate the micro with the macro reality. Ahmad discusses in detail the curent distributional pattern of Muslim population in India and attributes it to seven factors. When he describes the pattern for Bihar and Rajasthan in the volumes under reference he brings out the subtle interplay of the distant historical factors and the contemporary developments. One hopes that as the author completes the other volumes in the series his observations would enable the readers to reconstruct the details of the process of evolution and dispersal of Muslim population in India.

The biggest strength of Ahmad's book is the massive primary data base which he (with the help of research staff, technical assistants, field investigators, computer programmers etc.) generated through questionnaires. Since he timed the field surveys to broadly coincide with the 1991 Census operations, the primary data on various demographic, social, and economic indicators analysed in the backdrop of the Census data succeed in weaving the ground realities with the broader patterns. The author's claim of having created a data base 'hitherto non-existent' is thus quite justified.

Ahmad's style is lucid, his argument convincing and his analysis : well, the analytical part of his books falls short of expectations. He raises high hopes as he introduces the theme of each unit and claims every time that he is basing himself on so many tables and figures. As one reads through the units, tables follows one another, so do figures and maps (very meticulously designed using appropriate cartographic techniques) but the analytical content in each unit is disproportionately small. And if the facts relating to Muslim population in a state correspond to general situation in India the author only makes an observation or two. Isn't some explanation necessary all the same? Similarly very interesting inter-community comparisons are made but no explanation, not even tentative ones, are offered. For identifying the relationship between distribution of Muslims and the spread of literacy he observes that though there are statistical association between the two, these do not reveal any cause-effect relationships. In the backgrounders he gives excellent details on educational infrastructure, patterns of literacy (both male-female, rural-urban differentials, enrolment by stages etc.). He raises a fundamental question relating to the differential impact of literacy programmes especially their marginal success in areas with high concentration of Muslim population. He only hints at the structural disabilities of the programmes,- at the level of conceptualisation, formulation, implementation and acceptance. The question is complex but Ahmad prefers not to hazard an answer. His massive data base also does not come to his rescue. We will get back to it a little later.

Inter-community comparisons (mainly between Hindu and Muslim population) with regard to various parameters of demographic structure, structure of workforce would be extemely enriching for those interested in population studies whether they are in demography, social anthropology or population geography. Such comparisons give deeper insights when gross pattern camouflage the underlying micro realities. This is Ahmad's singlar contribution for which he deserves



kudos. He is able to break several myths which grip the innocent and not-so-innocent observers of the social fabric of India.

The sponsors of Ahmad's project-Hamard Educational Society (The volumes are duly dedicated to its President-Hakeem Abdul Hameed Sahib) must have had pious motives in accepting the idea of bench-mark educational surveys in different parts of the country. These surveys, the society must have hoped, would provide crucial inputs for improving the literacy levels, and educational standards of Muslim population. It is therefore understandable as to why Ahmed has devoted full two units (5&6) and a sizeable part of the Introduction, Background and Social Structure Units in each volume to literacy and education-employment linkages and linguistic composition. At the outset he identified two important questions: whether religious identity plays any role in determining the size of the household? Whether the language declaration of people reflects their bondage to their cultural identity or is determined by their affinity to a certain religion? However, the unit on social structure in which these questions have been raised appears inconclusive for the author does not offer any answers to questions he himself had raised. Besides, if 27 per cent of Muslims declared languages/dialects other than Urdu as their mother tongue (Bengali (13.3), Bhojpuri (7.15), Maithali (5.12) and Marwari (0.79), one could look into the impact, if any, of such a linguistic situation on the literacy levels and enrolment ratios. Ahmed is pained to point out that the educational levels among the Muslims are low. This even secondary data from Census of India have revealed decade after decade and primary data generated through immense labour do not educate us better. The real challenge was to identify the impediments rather than simply saying that much work needs to be done "to lift a community from the mire of ignorance". While

describing the phenomenon of drop-out, the author observes that sex-disparity increases beyond the age of 15 years for all-age cohorts and that it is equally true for both Muslims and Hindus. Again no factors, general or specific, are identified to explain this wastage of human resources. Perhaps as other volumes under the present series are underway, Ahmed might like to delve a little deeper into the questions of language-religion-literacy-development linkages.

One cannot but agree with the author that his studies and mines (or shall we say piles) of data have far reaching policy implications and would "enlighten the policy makers". He would like them to "redesign their policies and action plans". Certainly scores of concerned people in all communities would share these sentiments. But from a scholar of Ahmed's stature a blueprint was expected through the findings of his studies. No concrete suggestions could be located in the first two volumes which deal with the two extremities of the so called Hindi Heartland of India. Perhaps, the author plans to come out with a grand summary of his observations for different cultural regions of India which will cover Bengal, Bhojpur, Rohilkhand, Doab, Delhi, Mewar, Malwa, Maharashtra, Deccan and Dravidian South, Semi-arid Rajasthan. This would be worth the waiting. Meanwhile we must thank the author for (i) successfully generating a rich data for reference of researchers in different social science disciplines; (ii) conceptualising and executing the project on an all-India scale; (iii) excellent quality of the figures including maps; (iv) indicating the strength of a spatial perspective for understanding social reality in India; and (v) proving that geography is an empowering discipline capable of responding, even if partially, to the challenges of our times.

## MAP SERIES : I

# INDIA'S POPULATION : A CARTOGRAPHIC VIEW

R.C. CHANDNA  
Chandigarh, India

### GROWTH OF POPULATION (Maps 1 and 2)

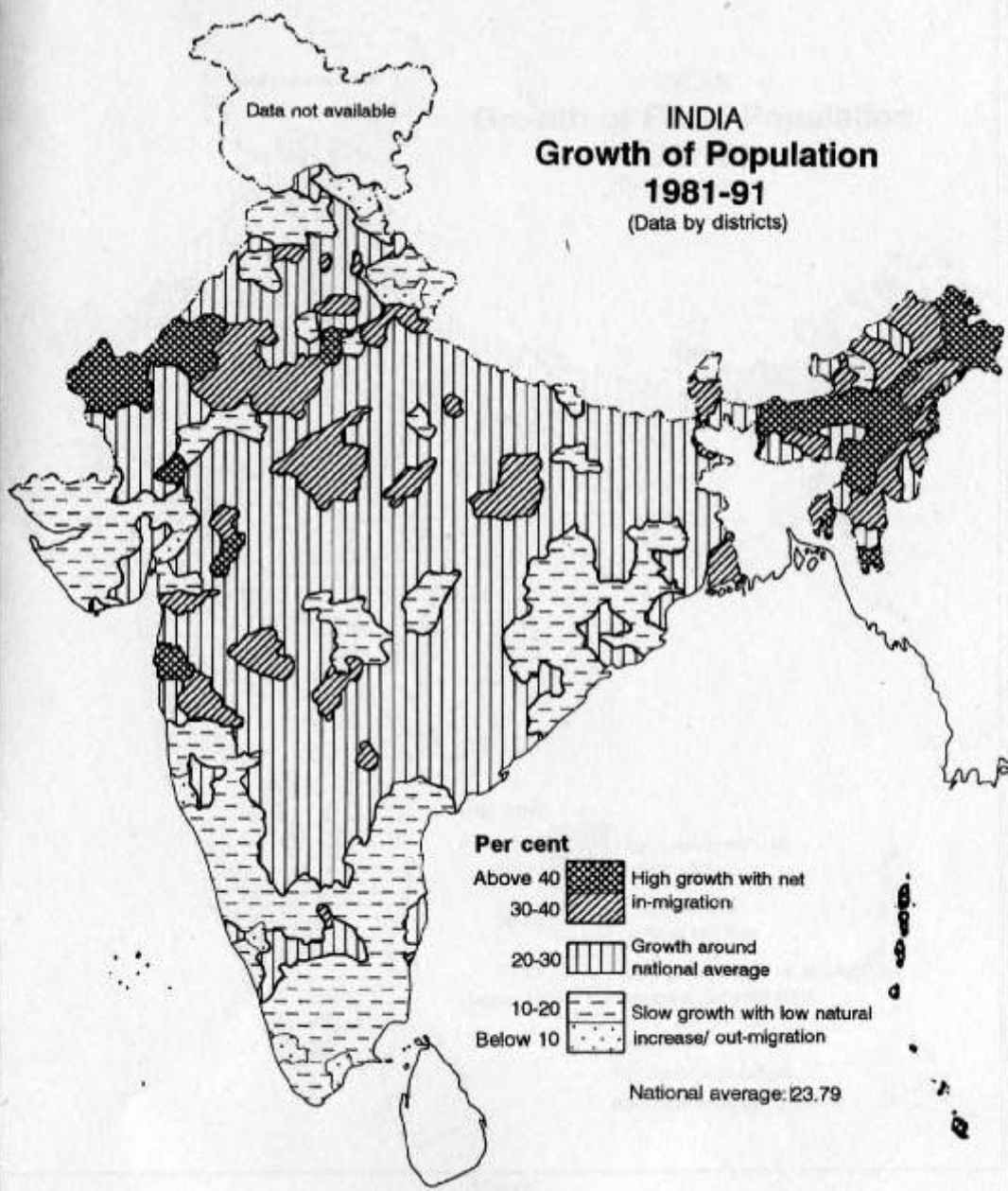
- National average growth rate of 23.79% during 1981-91 indicates a marginal fall in the country's growth which signals the beginning of a new era in India's demographic history.
- However, India's success in bringing down its much too high growth rate has been spatially uneven.
- Kerala, Tamil Nadu, Nagaland, Karnataka have made commendable progress, while Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh continue to hold back the country's overall progress in this regard.
- Considerably expanded areas of slow growth in the south, east and west of Peninsular India indicate that the South still retains its lead position in lower rate of natural increase.
- In all, 10% of the districts in India, spread over to all types of States in the country, recorded a slow growth of less than 15%.
- Much wider a spread of slow growth areas in case of rural population signals the take-off stage even in the countryside.
- High rate of growth in the Northeast, despite its high literacy, is associated with the region's net gain in migration.
- Future performance of four states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh in controlling their fertility rates holds the key to India's progress on demographic front. The redeeming feature is that the mortality rates in these states have declined significantly and their fertility decline has already accelerated.

**SEX RATIO****(Maps 3 and 4)**

- In a sharp contrast to developed countries, India displays a deficiency of females with an average sex ratio of 927 females per thousand males.
- Continued female deficiency is legacy of the past, despite recent increase in female's life expectancy at birth. The 1991 census revealed a female life expectancy of 59.1 years against the male life expectancy of 58.1 years.
- The danger of pre-birth sex determination turning into a surrogate of female infanticide of historic past might neutralise the gains of improving female life expectancy.
- However, in 10% of the districts in the country the females outnumber the males. Such districts are spread over in Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, hill districts of Uttar Pradesh, etc.
- Widespread deficiency of females is more acute in the north and is of lesser degree in the south.
- The North-South divide between Peninsular India and Indo-Gangetic Plain is most evident on the Sex Ratio map. Aryan north has comparatively lower sex ratios than the Dravidian south. The differences in the status granted to women by the two cultural groups might be finding expression through their sex ratios.
- Migration seems to have influenced sex ratio of areas of its origin as well as of destination more in case of north India than in the south due to higher incidence of its sex selectivity among migrants in the former.

Data not available

# INDIA Growth of Population 1981-91 (Data by districts)



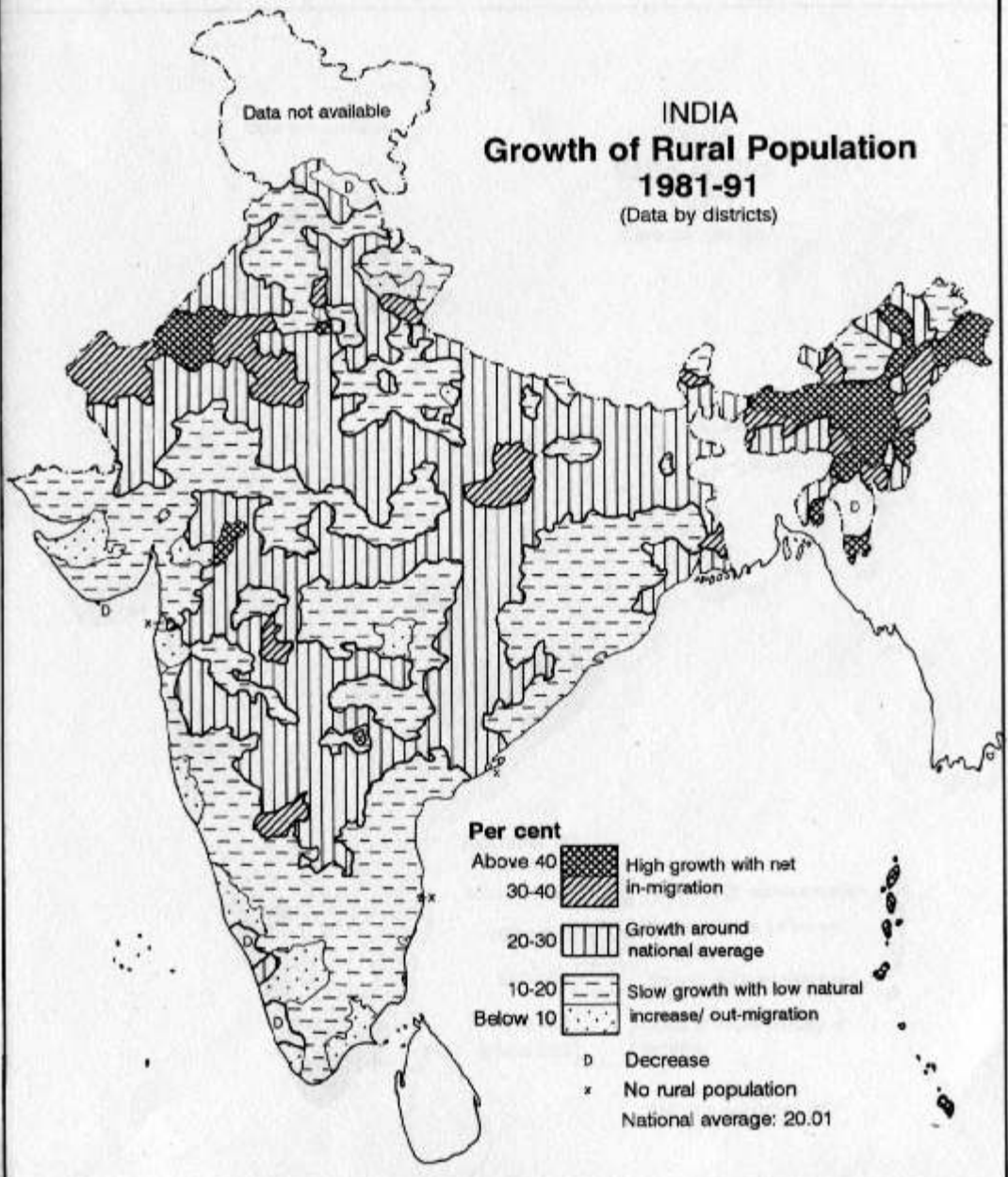
Map 1

Data not available

# INDIA

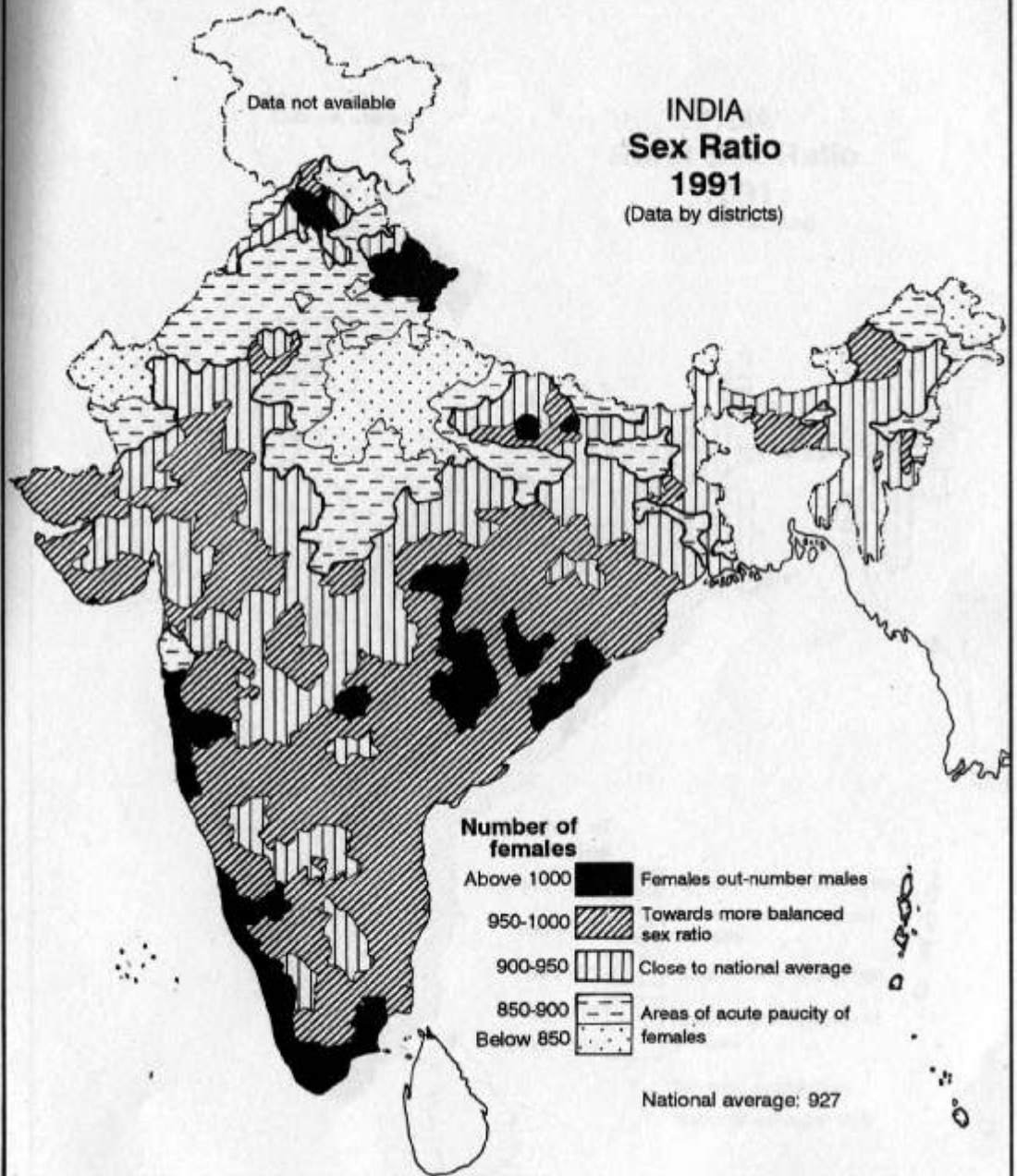
## Growth of Rural Population

1981-91  
(Data by districts)



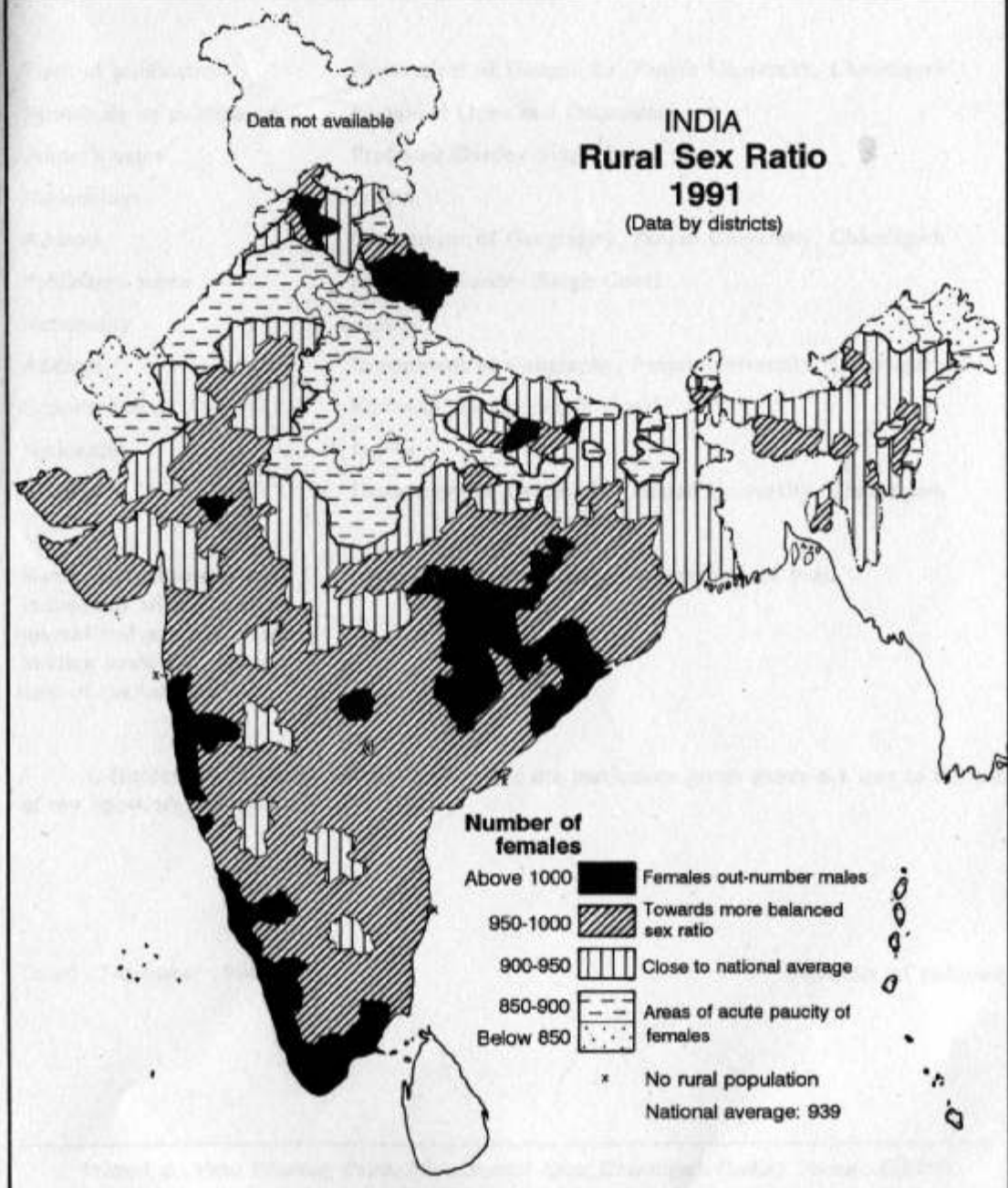
Map 2

**INDIA**  
**Sex Ratio**  
**1991**  
 (Data by districts)



Map 3

**INDIA**  
**Rural Sex Ratio**  
**1991**  
 (Data by districts)



Map 4