# WORKFORCE PARTICIPATION IN NORTH-WEST INDIA (1971-81)

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Certified that the dissertation entitled "WORKFORCE PARTICIPATION IN NORTH-WEST INDIA, 1971-81" submitted by Naresh Malik in partial fulfilment for the award of the Degree of Master of Philosophy of this University is his own work and has not been submitted previously in any University for award of this or any other degree. We recommend that this dissertation may be placed before the examiners for evaluation.

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(NARESH MALIK)

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# CHAPTER - I

## INTRODUCTION

### Statement of the Problem and its Objectives:

A significant attribute of population reflecting man-land relationship is people's participation in economic activities. Not everyone in the population, who is a consumer of goods and services, participates in the process of production. Only those who are engaged in the production of goods and services constitute the economically active population of any nation or society. An economically active population comprises all persons of either sex, who furnish the supply of labour available for the production of economic goods and services during the time reference period chosen for the investigation. It includes both, the persons in the civilian labour force and those serving in the armed forces. Thus the working population forms the backbone of a country's economy as it contributes to the national income through production or by offering services. The proportion of workers within working

age-group (i.e. 15-59 years) can be taken as an index of a country's economic development. Its study can be of a great help in planning man-power resources.

The present study entitled "Workforce Participation in North-West India, 1971-81", is an attempt to analyse some broad aspects of workforce participation in the region. Interpretation of spatial pattern of variation in workforce participation rate and its causes has been one of the primary objective of the present investigation. Further, the proportion of workers within working age-group (i.e. 15-59 years) has also been examined. Male-female differentials and the rural-urban differentials in workforce participation rates have also been attempted. While studying the workforce participation, its sectoral distribution has also been analysed. A spatio-temporal analysis of the sectoral distribution over the 1971-81 decade has been brought out through a discussion on Sectoral-shift during the said period.

## The Earlier Studies:

The study of economic attributes of a population is an important aspect as it is an index of economic development. Various scholars and researchers have analysed the pattern and causes of spatial differentiation in the proportion of working population. Boserup

analysed the impact of economic development and modernisation on female workforce participation rate in developing countiries. She holds that modernisation and mechanisation in both agricultural and industrial sectors of the economy have had a negative impact on female work participation thereby causing reduction in the aggregate workforce participation rate.[1]

Dadi attributes inter-state variations in workforce participation rates to workforce tendencies reflected in socio-economic factors, age-structure and sex-composition of population[2]. Gulati has tried to see inter-state differentials in female work participation rate in terms of disparities in per-capita income, the cropping pattern, dissimilarities in rate of male participation, varying proportion of scheduled caste and scheduled tribe population, differing sex-ratio and literacy[3]. Krishan and Chandna examined the working force and its occupational structure in Haryana. They hold that despite a net gain in the balance sheet of in and out migration (usually of workers), Haryana

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1. *Boserup,E.: "Women in Economic Development", London, 1970, George and Allen.*

2. *Dadi, M.M.(1972):"Variations in Labour Force Participation - An Interregional Analysis", Indian Census Centenary Seminar, Demographic Aspects of Labour Supply and Employment, Controller of Publications, Ministry of Home Affairs, Government of India.*

3. *Gulati,L.:"Occupational Distribution of Working Women: An INter-State Comparison", Economic and Political Weekly,1975, Vol. X,No.43*

has very low proportion of workers in the country. Its low participation rate and consequent high dependency ratio is the product of extremely low participation of females in economic activities, a high rate of natural increase resulting in a larger proportion of children below working age[4]. Gupta while writing a dissertation, analysed the spatial patterns of working force in India, 1971. He attributed the high proportion of working population to the high proportion of scheduled caste population, less diversified economy, subsistence level of agriculture coupled with hostile physical environment and almost no taboos aginst female participation in work-force. The low proportion of workforce is related to high degree of urbanisation, strong taboos against female participation and literacy rates[5]. The present study analyses the spatial pattern of working population in north-west India, and factors responsible for the observed pattern. It tries to study the correlation between workforce participation rate and certain explanatory variables like the proportion of scheduled caste population, degree of urbanisation, sex-ratio, dependency ratio, variation in female workforce participation rate,

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4. *Krishan, Gopal and Chandna, R.C.: "Haryana: Working Force and its Occupational Structure, 1971", Manpower Journal, Vol. X, No.2, 1974, pp.56-72.*

5. *Gupta S.C.: "Spatial Patterns of Working Force in India, 1971", A Dissertation (unpublished) submitted for the award of degree of Master of Philosophy in the Faculty of Arts (Geogrphy), Panjab University, Chandigarh, 1981.*

proportion of irrigated area, intensity of cropping pattern etc.

## Relevance of the Study:

Whether densely or sparsely distributed, gathered into or scattered over the countryside, whether prolific or sterile, tied to one spot or migratory, all human beings in order to live must engage in some kind of economic activity. Hence the spatial pattern of workforce participation rate should not vary much from one region to another. But contrary to what one might at first expect, the proportion of 'active' population in the total varies widely. An investigation into causal factors of workforce participation pattern seems to provide the answer. Moreover, the occupational structure of labour brought out by the study of its distribution among industrial sectors; and rural-urban and sub-regional distribution within the region are highly relevant to productivity and economic growth.[6]

Further, with economic development of a region, there are structural changes in the economy reflected through consequent shift in the sectoral distribution of workforce. The past few decades have seen the massive investments in non-agricultural as well as agricultural

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6. *U.N.; "The determinants and consequencies of population trends", Population Studies, No. 50, Vol. I.I. (U.N.DE & SA) New York 1973, p. 224.*

sectors. This investment must show objective measurable results by way of sectoral-shifts, however small, for not even the uniqueness of India can defy the universal behaviour of production, saving and investment[7]. Hence an investigation into the pattern and trend of sectoral-shift over the decade 1971-81 would be a useful study.

## The Study Area; A Geographical Profile:

The present study covers the North-Western region of India comprising the states of Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana and Rajasthan. The regional diversity in the proportion of working population in North-West India prompts to take up this region for a detailed analysis. The low proportion of workers to total population (30 per cent in 1981) and the sub-regional variations in the workforce participation rates merits a detailed study as to its causes. The region comprises both the developing and the underdeveloped sub-regions. The states of Punjab and Haryana are more developed in terms of agricultural and non-agricultural sectors and have diverse economic base. In contrast, the states of Rajasthan, Jammu and Kashmir and Himachal Pradesh are still underdeveloped in terms of agricultural and industrial development. The economy of these states is less diversified as compared to that of Punjab and Haryana.

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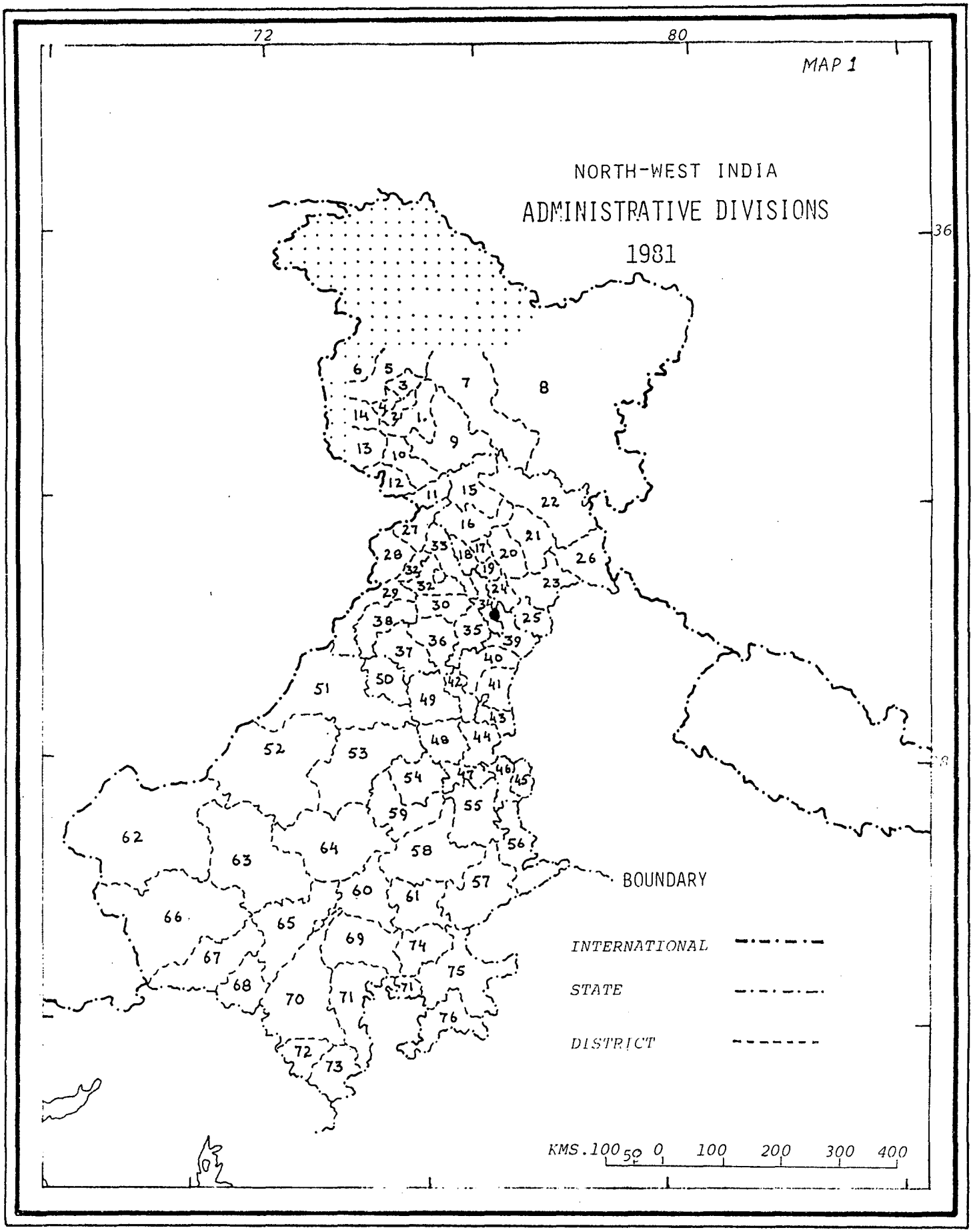
7. *Mitra, Asok: Census of India, 1961. Vol. I, Part-I A (i); ' Levels of Regional Development in India', p.266.*


MAP 1
NORTH-WEST INDIA
ADMINISTRATIVE DIVISIONS
1981
72
80
36
BOUNDARY
INTERNATIONAL
STATE
DISTRICT
KMS. 100 50 0 100 200 300 400

# ADMINISTRATIVE DIVISIONS OF NORTH-WEST INDIA (DISTRICTS)

*(INDEX TO THE PREVIOUS MAP)*

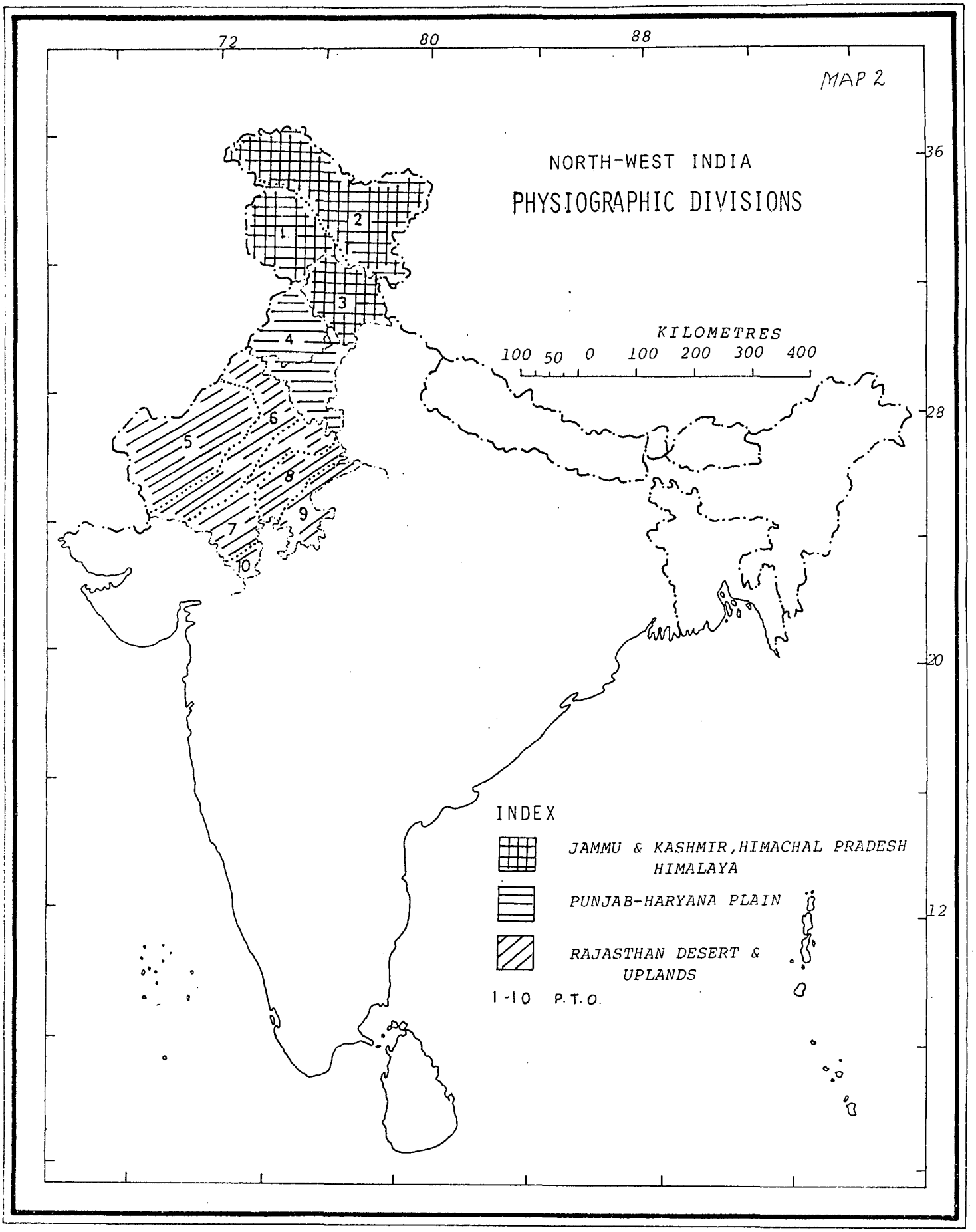
1. ANANTNAG
2. PULWAMA
3. SRINAGAR
4. BADGAM
5. BARAMULA
6. KUPWARA
7. KARGIL
8. LADAKH (LEH)
9. DODA
10. UDHAMPUR
11. KATHUA
12. JAMMU
13. RAJAURI
14. PUNCH
15. CHAMBA
16. KANGRA
17. HAMIRPUR
18. UNA
19. BILASPUR
20. MANDI
21. KULLU
22. LAHUL & SPITI
23. SHIMLA
24. SOLAN
25. SIRMAUR
26. KINNAUR
27. GURDASPUR
28. AMRITSAR
29. FIROZEPUR
30. LUDHIANA
31. JALANDHAR
32. KAPURTHALA
33. HOSHIRPUR
34. RUPNAGAR
35. PATIALA
36. SANGRUR
37. BHATINDA
38. FRIDKOT
39. AMBALA
40. KURUKSHETRA
41. KARNAL
42. JIND
43. SONIPAT
44. ROHTAK
45. FARIDABAD
46. GURGAON
47. MAHENDRAGARH
48. BHIWANI
49. HISAR
50. SIRSA
51. GANGANAGAR
52. BIKANER
53. CHURU
54. JHUNJHUNUN
55. ALWAR
56. BHARATPUR
57. SWAI MADHOPUR
58. JAIPUR
59. SIKAR
60. AJMER
61. TONK
62. JAISALMER
63. JODHPUR
64. NAGAUR
65. PALI
66. BARMER
67. JALOR
68. SIROHI
69. BHILWARA
70. UDAIPUR
71. CHITTORGARH
72. DUNGARPUR
73. BANSWARA
74. BUNDI
75. KOTA
76. JHALAWAR

North-West India, with 76 districts in the region in 1981, offers good scope for a meaningful analysis of spatial variation in workforce participation rate.

As to the physiographical attributes, the region can be divided into three major geographical sub-regions:

i) the Jammu and Kashmir, Himachal Pradesh Himalayan region;
ii) the Punjab-Haryana plain and
iii) the Rajasthan Desert and the uplands.

The Jammu and Kashmir - Himachal Pradesh Himalayan region sprawls over the western Himalayas. Pakistan to the west of Jammu and Kashmir and China to the north and east, strategically it is a very important sub-region. Owing to the rugged mountaineous terrain and hostile climatic conditions, only a small part of the land is available for agricultural pursuits. Net area under plough constitutes only 15 per cent in Jammu and Kashmir and 11 per cent in Himachal Pradesh. However, the vale of Kashmir,originally a synclinal valley, and the valley of Kullu-Manali possess rich fertile alluvium confined to river terraces and lower portions of the region. Cultivation of rice and wheat provides the cereals. Plantation of tea and fruits is also done in the area. Industrially, the area is very backward. Howèver, there is some development of cottage industries such as production of wool and weaving of carpets. Population is sparsely distributed in the


MAP 2
NORTH-WEST INDIA
PHYSIOGRAPHIC DIVISIONS
72
80
88
36
28
20
12
KILOMETRES
100 50 0 100 200 300 400
1
2
3
4
5
6
7
8
9
10
INDEX
JAMMU & KASHMIR, HIMACHAL PRADESH HIMALAYA
PUNJAB-HARYANA PLAIN
RAJASTHAN DESERT & UPLANDS
1-10 P.T.O.

# PHYSIOGRAPHIC DIVISIONS OF NORTH-WEST INDIA

*(INDEX TO THE PREVIOUS MAP)*

1. *SOUTH KASHMIR HIMALAYA.*
2. *NORTH KASHMIR HIMALAYA.*
3. *HIMACHAL PRADESH HIMALAYA.*
4. *PUNJAB-HARYANA PLAIN.*
5. *RAJASTHAN THAR DESERT.*
6. *RAJASTHAN BAGAR.*
7. *ARAVALI RANGE.*
8. *EAST RAJASTHAN UPLANDS.*
9. *NORTH CENTRAL HIGH LANDS.*
10. *MALWA PLATEAU.*

western districts of Jammu and Kashmir and north-eastern Himachal Pradesh,the hostile areas for human habitation.

The fertile lowland of the Punjab-Haryana Plain lies between the stony and highly broken slopes of the Himalayan mountains to the north and the parched tracts to the south. This plain stretches like a corridor to the mainland and merges into the rich Ganga Plain in the east. Endowed with a vast alluvial plain and supplemental irrigation, this region is agriculturally far advanced to the other two regions in producing marketable surplus food-grains. Almost 80 per cent of the total area of this this region is under cultivation. This percentage,however, decreases in districts adjoining the Siwalik range where it varies from 50 to 65 per cent. Perennial irrigation is available for large tracts. Nearly 40 per cent of the net area sown is cropped more than once. Though agriculture is the mainstay of the people of this region, there are several industries. Hydro-electricity and thermal plants are the main sources of power-supply in the region. Faridabad, Gurgaon, Dharuhera, Panipat, Sonipat, Pinjore, Ludhiana and Jalandhar are the important industrial towns known for automobile industry, manufacturing of watches, woollen fabrics, bicycles, fertilizers, sugar etc. This area is the most densely populated one and is economically an advanced sub-region. The average density of population in 1981 was 375 persons per square kilometre.

The third sub-region comprising Rajasthan desert and uplands is characterised by aridity, wind-blown sand and sparse vegetation. Most of the area being arid is unsuitable for growth of natural vegetation and raising crops. In the western parts of this region where rainfall is scanty, rearing of camels, sheep, goats and other cattle is the mainstay of the people. However, owing to irrigational facilities in Ganganagar, Bikaner and along Haryana and Uttar Pradesh borders, the area is suitable for agriculture. Industrially, it is backward, only few industries being in the south-east. Gypsum is mined in Bikaner, Nagaur districts and lignite is mined at Palna in Bikaner. The building stone is also mined at different places like Kota,Hindon etc. The density of population and the proportion of net area sown to the total area decreases with increasing aridity conditions in the western parts. The overall density was 65 persons per square kilometre in 1981.

## Theoretical Basis and Formulation of Hypothesis:

There are wide variations in the proportion of workers in India. According to census (1981), the state of Nagaland had the highest proportion of workers (47.5 per cent), the lowest being in Kerala (26.7 per cent). The north-west region of India is no exception to the phenomenon of spatial variability of working population.

At district level in 1981 Lahul and Spiti exhibited the highest proportion of workers (59 per cent) and the lowest being in Una (23 per cent), both in the state of Himachal Pradesh in north-west region. The workforce participation rate is correlated positively or negatively to certain explanatory factors causing spatial variability in the proportion of workers. Since the influence of the explanatory independent variables is not same in case of all the districts and again the distribution of factors affecting workforce participation rate (WPR) is not equal among districts, this might be leading to the variations is WPR.

One unique feature of the Indian social structure is the prevailing caste system. There are many castes in India. Broadly, they can be divided into upper castes, lower castes and scheduled castes/tribes. Customs and social norms vary from one caste to another. Among scheduled caste population the workforce participation rate is higher than non-scheduled caste population. The main reason can be seen in the centuries of economic deprivations. Since the people belonging to the scheduled castes live on subsistence economy, in their case it becomes imperative for both men and women to engage in economic activity so as to have their survival. Even their young children must participate in economic activity.

The level of education is another important factor influencing the WPR. Though the higher education opens up the frontiers for acquiring a job, but it certainly delays one's entry in the workforce. Further, in a situation like that of India, once one gets literate and attains higher level of education, his expectation gets changed from those who are illiterate. Now, he would not like to accept less paid job and also becomes very much selective in doing a job.

The degree of urbanisation is yet another indicator of TWPR. The proportion of workers in rural areas is higher than that of urban areas. Primary sector, is, by and large, a rural sector of the economy whereas the other two sectors viz. secondary and tertiary are the urban sectors. The proportion of main workers in primary sector is higher than those of other two sectors. Since rural population is primarily dependent upon agriculture, it requires participation by maximum number of persons to perform the chores connected with it. Their performance requires no special skill thereby absorbing maximum number of workers. In urban areas, on the other hand, most jobs require education and/or skill which takes long to acquire, thus delaying entry in workforce. Moreover, a large proportion of people in urban areas is more aware and have better means for

educating their children. The literacy rates are higher in urban areas in contrast to rural areas. The combined effect of all such factors is that there exists a negative correlation between the degree of urbanisation and TWPR.

Dependency ratio* is another factor which may affect WPR. In case of India, higher dependency ratio is due to higher proportion of children below 15 years of age thereby increasing the proportion of population in non-working age-group causing WPR to be lower.

Sex-ratio** is another factor which may have either positive or negative correlation with WPR. Due to regional diversity in female workforce participation rate, this factor is correlated differently in various states. Areas having low workforce participation rate among females shall exhibit a negative correlation between sex-ratio and WPR, whereas areas having high workforce participation rate among females shall show a positive correlation between sex-ratio and WPR.

The variations in TWPR can also be explained in terms of variability in the proportion of female workers. Further, the variations in the proportion of main workers

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* *Dependency ratio* = $\frac{\text{Population } (0\text{-}14)_y + \text{Population } (60 \text{ and above})_y}{\text{Population } (15\text{-}59)_y} \times 100$

*y = year group.*

** *Sex-ratio is number of females per hunred males in population.*

in primary sector can also explain the variability in TWPR. Since a larger proportion of workers is engaged in primary activities, this would imply that areas having primary sector as the base of their economy, shall have high proportion of workers. In contrast, the areas where the secondary and tertiary sectors in combination with agricultural sector forms the basis of economy, the TWPR may be low.

The TWPR may also be influenced by certain agricultural factors like the corpping pattern in favour of labour intensive crops, intensity of cropping i.e. proportion of area sown more than once to net area sown and irrigation. The areas growing labour intensive crops such as rice, tea etc. have high incidence of workforce participation rates. In contrast, the areas growing wheat have just the reverse trend[8]. Further the irrigation facilities lead to intensive cultivation. With intensive cultivation use of high yielding variety seeds and fertilisers is inevitable. Although the work-force participation rate among females may decline with introduction of new technology and mechanisation in agriculture[9]. But its share in TWPR is very marginal, as the case is in Haryana and Punjab. The overall

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*8. Gulati: op.cit.p.37*

*9. Reddy, D.N.: "Female Workforce Participation: A study of Inter-State Differences - A Comment", Economic and Political Weekly, Vol. X, No.23, June 7, 1975.*

*and*

*Laurder, Arizpe: "Women in the Informal Labour Sector: The Case of Mexico City", in Women and National Development, The Complexities of Change (ed) the Wellesley Editorial Committee; Chicago, Univ. of Chicago Press,1977, pp.261-62.*

participation rate would rise with introduction of new technology and irrigational facilities, as more and more area would be made available for cultivation and proportion of area sown more than once would increase.

On the basis of the above theoretical framework, the following hypotheses explaining regional differentials in workforce participation rate are formulated:

1. If the proportion of scheduled caste population is high in a region, the workforce participation rate will also be high and vice-versa. This will apply to both total and rural populations.
2. If the degree of urbanisation is high in a region, the total workforce participation rate shall be low and a negative relationship between the two will be exhibited.
3. If the literacy rate, both in total and rural areas is high, the workforce participation rate in corresponding areas will be low.
4. If the dependency ratio is high, it will have a negative effect on workforce participation rate in a region.
5. Sex-ratio may be correlated positively or negatively with TWPR, depending upon the proportion of female population in workforce. It will have a negative correlation in areas having low female workforce participation rate and vice-versa.

6. If the female workforce participation rate is high in a region, the workforce particpation rate will also be high.
7. If the proportion of main workers in primary sector is high in a region, the WPR will also be high. The phenomenon will hold better in rural areas.
8. If the percentage of irrigated area to net sown area is high, the workfroce participation will also be high, and more so in case of rural areas.
9. If the proportion of area sown more than once is high in a region, the WPR will also be high, the model holding good in rural areas.

## Chapter Scheme:

The following chapter scheme besides the introductory chapter has been adopted to present the analysis.

In Chapter II, the methodology adopted to conduct the study will be discussed. It includes a discussion on the data-base and the statistical tools used to arrive at various conclusions.

In Chapter III, the spatial pattern of working population in north-west India will be analysed. Aggregative pattern of workforce particpation; proportion of workers in the working age-group; rural-urban differentials and male-female differentials will be the subtopics of discussion in this chapter. The degree of variability in TWPR is also discussed separately.

In the next chapter i.e. IV, sectoral distribution of workforce as a whole and for rural/urban areas will be discussed separately. Further, pattern and trend of shift in three sectors of economy viz. primary, secondary and tertiary over the decade 1971-81 will be examined. The co-efficient of variation to show the degree of variability in different sectors is also computed and discussed.

In chapter V, the final analysis of some of the socio-economic and demographic factors responsible for the pattern of workfroce participation rate will be analysed while testing the hypotheses formulated in this chapter. For this purpose the statistical techniques of simple correlation and multiple regression have been applied for different states separately and the region as a whole.

The final chapter i.e. VI, is a birds eye-view of the conclusions arrived at the end of each chapter.

# CHAPTER - II

## METHODOLOGY

### Data Base; Concepts and Definitions:

Before embarking on the analysis of economic characteristics of the population, it would be useful to clarify the approach to be followed in this study and about definitions of the terms and concepts used in various censuses.

### Approach:

In the literature on labour force, there are two well recognised approaches to the collection and classification of economic data: the gainful occupation approach and the labour force approach[1]. According to the gainful occupation approach a person is identified as economically active if he considers himself to have gainful occupation. The basis of classifying a person into economically active or otherwise is the respondent's evaluation of his status rather than any objective criterion

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1. Sinha, J.N.: *"The Indian Working Force" (Its growth and Changing Composition) Census of India, 1961, Vol.I,Monograph 11, p.1.*

to be applied by the enumerator. Further, what the respondent is asked to report is his 'usual status' regardless of his or her activity at the time of enumeration or in any specific period prior to that[2]. This approach has such advantages as: the question's are simple; the seasonal variations do not influence the data collected. But the approach can not produce very useful and reliable data because of certain reasons like (i) the data do not refer to any specific reference period, (ii) it can not provide accurate data on unemployment because those seeking work at the time of enumeration, but were in employment before, will be counted as gainful workers and lastly, persons whose contributions to the economic activity are negligible because there is no specific reference period, may get included as workers.

The labour force approach classifies persons on the basis of their activity during a specific reference period. Those people who on the day of the census or during a specified period just prior to the census enumeration are employed, are considered economically active. "According to this

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2. *Ibid, p.1.*

approach the person does not decide whether or not he is in the labour force but simply reports to the enumerator the nature of his activities in the reference period. The enumerator places him in the labour force if his activity contributes or is intended to contribute to the national product"[3]. Those who do not belong to either of the categories viz. employed or unemployed, are not included in the labour force. Though this method overcomes some of the weaknesses of the gainful worker approach, it is certainly not an ideal method. Although there is a specific reference period of a week,month etc., care should be taken to select the most representative period of the year for enumeration. Even so, the data are likely to be affected by temporary and seasonal conditions at the time of the census.

## Definition:

The economic question of defining a worker has baffled academicians and census officials so much so that every new census comes out with a fresh definition, which have had its consequences of temporal comparability. Generally speaking, in the

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*3. Ibid, p.1.*

census of India, 1951, the classification of workers and non-workers was based on the 'income-approach' in which persons were classified as 'self-supporting', 'earning dependents' and 'non-earning dependents', depending on the fact as to whether their earnings were sufficient to support them[4]. However, this approach was abandoned at the time of 1961 census operations which instead categorised a person as 'worker' in such activities like cultivation,dairying, household industry etc. if he had some regular work of more than an hour a day throughout the greater part of the working season. In case of regular employment in any trade, profession, services or business, the basis was whether the person was employed during any of the 15 days preceding the day on which the household was visited by the census enumerator[5]. Any woman, who in addition to her household work, engaged herself in work for sales or wages, or in domestic services for wages for others, was treated as a worker[6].

During the 1971 census operations, all persons were divided into two broad categories of "workers"

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4. *Ibid, p.2.*
5. *Ibid, p.2.*
6. *Premi, M.K.: et al., "An Introduction to Social Demography", New Delhi; Vikas; 1983 pp.55-56.*

and "non-workers", according to the main activity of engagement and not according to his subsidiary occupation. Thus a 'worker' was a person whose main activity was participation in any economically productive work by his physical or mental activity. Work involved not only actual work but also effective supervision and direction of work. In case of regular work like trade, business, profession, services etc., a person was regarded as a worker, if he had participated in such work on any one of the days during the preceding week. In respect of seasonal work, a person's main activity was ascertained with reference to such work in the last one year[7]. The impact of this change in the definition in 1971 census over that of 1961 was that it substantially brought down the total volume of workers despite an increase in the population. The female work participation suffered the most.



In 1981 census the definition of 'work' adopted was as follows:

"Work may be defined as participation in any economically productive work. Such participation

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7. *Srivastva, S.C.: "Indian Census in Perspective", Office of the Registrar General, India, Ministry of Home Affairs, New Delhi, p.234.*

may be physical or mental in nature. Work involves not only actual work but also effective supervision and direction of work"[8].

The reference period in all the questions was one year preceding the date of enumeration. Certain types of work such as agriculture, household industry like 'gur' making etc. are carried on either throughout the year or only during certain seasons or parts of the year, depending on the local circumstances. In such cases, the broad time of the agricultural season preceding the day of enumeration was taken into account[9]. A person who satisfied the criterion laid for a 'worker' but was absent at the time of enumeration due to some reasons was also considered as worker. Persons who were engaged mainly in household activities or were students but had helped in the family's economic activities, were not considered as main workers, but were treated as marginal workers. A person who worked in the household manufacturing, if produced economic goods for personal consumption only, was not treated as worker. Money lenders, pensioners and likepersons were also considered as workers.

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*8. Ibid, p. 234*

*9. Ibid, pp.234-235*

The dichotomy of worker/non-worker of 1961 and 1971 censuses was discarded at the 1981 census and instead a trichotomy as main workers; marginal workers and non-workers was adopted. For main worker the time criterion of engagement in work for the major part of the year, at least 183 days, was adopted Those who worked for sometime during the year preceding the census but not for the major part, were treated as marginal workers. Those who had never worked during the last year were non-workers. It is noteworthy that the category of main workers was similar to one adopted in the 1971 census, while the main workers alongwith marginal workers are expected to be comparable workers according to 1961 census concept[10]. Further, while in 1961 and 1971 censuses, two different approaches 'namely usual' status and 'current status', were adopted with reference period of one year for seasonal work and one fortnight/week for regular work respectively. At the 1981 census the 'usual status' approach was adopted uniformly for all work[11].

It is obvious from the above discussion that the conceptual frame-work of defining a worker has under-

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*10. Premi, M.K.: op.cit. p.56.*

*11. Srivastva, S.C.: op.cit. p.237.*

gone changes at each census in the academic persuit of making it more and more comprehensive. However, the census provides data on economic attributes of population and may be used for analytical studies with a fair measure of reliability and confidence, despite certain marginal limitations in the conceptual framework. The present study, as to its objectives, is based mainly on the General Economic-Tables (B-series) of the Indian Censuses of 1971 and 1981. Since the conceptual framework of defining a 'worker' did not change over the censuses of 1971 and 1981, except the reference period, the data on main workers is expected to provide reasonable comparability over the decade of 1971-81.

## Data-Base:

The following census publications and tables therein form the basis of the present study.

1. Economic Tables, Part II-B, Series-8, Jammu and Kashmir, Director of Census Operations, Census of India, 1971. The tables used were:

   *i. Workers and non-workers according to main activity classified by sex and age-group,, B-I, Part-A;*

   *ii. Classification of workers and non-workers according to main activity by educational levels in Urban areas and Rural areas, B-III, Part A and B.*

2. General Economic Tables, Part-III A and B, Vol.1, Series-8, Jammu and Kashmir, Director of Census

Operations, Census of India, 1981. The tables used were:

*i. Main workers classified by industrial category, age and sex, B-3.*

*ii. Main workers classified by industrial category, educational level and sex for Rural and Urban areas, B-4, Part A and B.*

3. Economic Tables, Part-II B, Series-7, Himachal Pradesh, Director of Census Operations, Census of India, 1971.

*i. Workers and non-workers according to main activity classified by sex and age-group , Table B-1,Part A.*

*ii. Classification of workers and non-workers according to main activity by educational levels in Rural and Urban areas, B-III, Part A and B.*

4. General Economic Tables, Part-III A and B,Series-7, Himachal Pradesh, Director of Census Operations, Census of India, 1981.

*i. Main workers classified by industrial category, age and sex, B-3.*

*ii. Main workers classified by industrial category, educational level and sex for Rural and Urban areas, B-4, Part A and B.*

5. Economic Tables, Part II-B, Series-17, Punjab, Director of Census Operations, Census of India, 1971.

*i. Workers and non-workers according to main activity classified by sex and age-group; B-I, Part-A.*

*ii. Classification of workers and non-workers according to main activity by educational levels in Rural and Urban areas, B-III, Part A and B.*

6. General Economic Tables, Part III-A and B, Series-17, Punjab, Director of Census Operations, Census of India, 1981 (Unpublished).

*i. Main workers classified by industrial category, age and sex, B-3.*

*ii. Main workers classified by industrial category, educational level and sex for Rural and Urban areas, B-4, Part A and B.*

7. Economic Tables, Part II-B, Series-6, Haryana, Director of Census Operations, Census of India,1971.

*i. Workers and non-workers according to main activity classified by sex and age-group, B-1, Part-A.*

*ii. Classification of workers according to main activity by educational levels in Urban and Rural Areas,B-III, Part A and B.*

8. General Economic Tables, Part III-A and B,Vol.I, Series-6,Haryana, Director of Census Operations, Census of India, 1981.

*i. Main workers, marginal workers and non-workers by age, sex and literacy for Rural and Urban, B-2.*

*ii. Main workers classified by industrial category, age and sex, B-3.*

9. Economic Tables, Part II-B (i), Series-18, Rajasthan, Director of Census Operations, Census of India, 1971.

*i. Workers and non-workers according to main activity classified by sex and age-group, B-1, Part A.*

10. General Economic Tables, Part III-A and B Vol.I (i), Series-18, Rajasthan, Director of Census Operations, 1981.

    *i. Main workers, marginal workers and non-workers by age, sex and literacy for Rural and Urban areas, B-2.*

    *ii. Main workers classified by industrial category, age and sex, B-3.*

Further, while the data for the socio-demographic indicators were taken from the Indian Census, the Statistical Abstracts of the respective states were also referred to for some of the economic indicators. N.S.S. also supplies data on economic attributes of population, but it could not be used since the data at district level were not available.

## Methodology:

In the present study a systematic approach has been followed to present the analysis. Data were collected from various secondary sources as mentioned earlier. Processing of data was carried out in tune with the objectives of the present study.

## Pattern of Proportion of Workers:

In Chapter III, the pattern of workforce participation analysing the rural/urban and male/female components and work participation among working age-

group are shown by carrying out the following computations and thereby mapping the same:

i. Total workforce particpation rate computed as per cent of total population i.e.

$$TWPR = \frac{\text{Total main workers}}{\text{Total population}} \times 100$$

ii. Workforce participation in working age-group as per cent of population in age-group 15-59 i.e.

$$WPR = \frac{\text{Workers in the age-group 15-59}}{\text{Population in age-group 15-59}} \times 100$$

iii. Workforce participation in rural areas computed as per cent of rural population i.e.

$$RWPR = \frac{\text{Rural Workers}}{\text{Rural Population}} \times 100$$

iv. Workforce participation in urban areas computed as per cent of urban population i.e.

$$UWPR = \frac{\text{Urban Workers}}{\text{Urban Population}} \times 100$$

v. Workforce participation among males computed as per cent of male population i.e.

$$MWPR = \frac{\text{Total Male Workers}}{\text{Total Male Population}} \times 100$$

vi. Workforce participation among females computed as per cent of female population i.e.

$$FWPR = \frac{\text{Total Female Workers}}{\text{Total Female Population}} \times 100$$

## Sectoral Distribution of Workforce and the Sectoral-Shift:

The proportion of workers into three main sectors of the economy viz. primary, secondary and tertiary as per cent of main workers is discussed in Chapter IV. In order to show the sectoral-shift that took place in the decade 1971-81, the per cent participation rates into three sectors in 1971 have been substracted from that of 1981. In both the 1971 and 1981 censuses the main workers are classified into the following nine industrial categories.

i. Cultivators
ii. Agricultural labourers
iii. Live stock, Forestry, Fishing, Hunting, Plantations, Orchards and allied activities.
iv. Mining and Quarrying.
v. Manufacturing, Processing,Servicing and Repairs
   a. Household Industry
   b. Other than Household Industry.
vi. Construction
vii. Trade and Commerce
viii. Transport, Storage and Communications.
ix. Other Services.

All these nine industrial categories of workers given in the 1971 and 1981 censuses were grouped into three economic sectors i.e. primary,secondary and tertiary. In the primary sector the first four categories i.e. I, II, III and IV are included,while the next two categories, V (a) and (b) and VI are included in the secondary sector. The tertiary sector includes VII, VIII and IX categories.

## Degree of Variability in the Proportion of Workers:

It is a common phenomenon to observe the variability in work-force participation among various states and these differences are obvious within the states as well. To find out the degree of variations in workforce participation rates, the statistical techniques of standard deviation and co-efficient of variation have been applied and discussed in Chapter III. The formula applied for standard deviation is as follows:

$$\sigma = \sqrt{1/N \sum (x-\bar{x})^2}$$

Where N = number of districts

X = workforce participation rates.

For co-efficient of variation it is:

$$C.V. = \frac{\sigma}{\bar{x}} \times 100$$

Where $\sigma$ = Standard deviation

$\bar{x}$ = Mean.

## Zero-Order Correlation and Multiple Regression Analysis to test the Hypotheses:

Lastly in Chapter V, as per the objectives of the present study, the factors that may be correlated to the workforce participation rate are examined by the quantitative techniques of zero-order correlation and multiple regression. These techniques are useful in the present study so far as they help to show their effect on workforce particpation, individually and in combination. The following explanatory variables were taken into account to study how much the workforce participation depends upon them.

i. Percentage of scheduled caste population to aggregate population; for total and rural areas separately.

ii. Percentage of urban population to total population.

iii. Dependency ratio for total and rural areas separately.

iv. Literacy rate for total and rural areas separately.

v. Sex-ratio for total and rural areas separately.

vi. Female work-force participation rate for total and rural areas separately.

vii. Proportion of workers in primary sector for both the total and rural areas.

viii. Percentage of irrigated area to net area sown for both the total and rural areas.

ix. Percentage of area sown more than once to net area sown for both the total and rural areas.

Taking these above mentioned independent explanatory variables and workforce participation as dependent variable, a regression equation (taking district level cross-section data) is calculated for the five states separately and the north-west region of India as a whole. Further, in case of all the five states, the zero-order correlation and regression equation were calculated for total and rural areas separately.

## Limitations of the Study:

The spatio-temporal variation present in the proportion of workers in north-west India is undoubtedly observed in the region. In the present

study, while studying the factors affecting the pattern of workforce participation, some socio-economic and demographic factors are analysed. But due to non-availability of data, some of the basic economic variables like per-capita income, wage-rate etc. could not be taken into consider-ation. It is true that while calculating multiple regression one always needs those independent variables that may affect the dependent variable to obtain significant result.

Again some of the data relating to socio-cultural and psychological aspects, are not avail-able from the census which could have lent the analysis more credibility.

Lastly, the administrative boundaries of the districts were changed at micro-level viz.village over the decade 1971-81. (Jammu and Kashmir, Himachal Pradesh Punjab and Haryana) . However, the data could not be made comparable for the two points of time i.e. 1971 and 1981, because the data on economic attri-butes could not be adjusted at village level. Somehow, the comparability of the data was achieved by adjusting the data in 1981, making it comparable to 1971 administrative boundaries

at district level. Further, since the per cent participation rate is used for the purpose of the present study, the analysis arrived at is expected to be fairly comparable.

■■■■■■■

# CHAPTER - III

## PATTERN OF WORKFORCE PARTICIPATION

The pattern of workforce participation rate varies widely from country to country and from region to region of a particular country. The differences in the participation rate of working population become apparent even at micro levels, for example, among states and among various districts.

### International Scenario:

In developed countries the proportion of workers to population ranges between two-fifths to more than half, in developing countries it ranges between one-third to less than one-fifth (Table 1).

The low proportion of workers in the developing countries in general, and, in India, in particular, has to be seen in the context of the stage of demographic evolution a country is experiencing. Most of such countries are in the second stage of demographic transition whereby the rate of natural increase is explosive. It raises the proportion of population in the non-working age-

## TABLE - 1

Total Working Force of Selected Developed & Developing Countries as Per Cent to Total Population

| Country | Year | Per Cent |
|---|---|---|
| Developed | | |
| U.S.S.R. | 1970 | 55.0 |
| Japan | 1971 | 48.7 |
| U.S.A. | 1971 | 38.2 |
| Canada | 1971 | 37.3 |
| Developing | | |
| India | 1971 | 32.9 |
| Iraq | 1970 | 28.1 |
| Mexico | 1970 | 26.9 |
| Algeria | 1966 | 19.3 |

*SOURCE: Figures for different countries have been taken from various sources indluding Garnier, J.B., Geography of Population, Longman Inc., New York, 1978; Statesman's Year Book, 1970-71, St.Martin's Press, 1970; The Europa Year Book, 1973, A World Survey, Europa Publications Ltd.*

groups.

## Inter-State Pattern of Workforce Participation Rate in India:

For the purpose of analysis the states have been categorised as areas of high proportion and low proportion of workers than the national average viz. 33* per cent and 33.5* per cent in 1971 and 1981 censuses respectively. (Table 2 ).

## Areas of High Participation Rate:

Andhra Pradesh, Tamil Nadu, Karnataka, Madhya Pradesh and Maharashtra formed the largest single contiguous area of high proportion of workers. In Andhra Pradesh, agriculture with emphasis on a number of labour intensive crops such as rice, tobacco, cotton, turmeric etc. was the probable cause of high proportion of workers. Development of irrigation facilities and large land-holdings might have greatly increased the demand for labour. In addition to this mining of coal, manganese and

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* *Excludes Assam where census could not be held owing to disturbed conditions prevailing there at the time of 1981 census. Also excludes population of areas under unlawful occupation of Pakistan and China where census could not be taken.*

*Note: In what follows, only the main workers of 1981 census have been considered for all the analysis so as to maintain comparability with the 1971 census.*

## TABLE - 2

Proportion (in per cent) of Main Workers to Total Population in India and States, 1971 and 1981.

| India/State/Union Territory | 1971 | 1981 |
|---|---|---|
| India* | 33.06 | 33.45 |
| STATES | | |
| Andhra Pradesh | 41.39 | 42.26 |
| Bihar | 31.03 | 29.68 |
| Gujarat | 31.45 | 32.22 |
| Haryana | 26.44 | 28.35 |
| Himachal Pradesh | 36.95 | 34.36 |
| Jammu & Kashmir | 29.74 | 30.37 |
| Karnataka | 34.74 | 36.76 |
| Kerala | 29.12 | 26.68 |
| Madhya Pradesh | 36.72 | 38.41 |
| Maharashtra | 36.48 | 38.71 |
| Manipur | 34.57 | 40.35 |
| Meghalaya | 44.17 | 43.44 |
| Nagaland | 50.75 | 47.53 |
| Orissa | 31.22 | 32.75 |
| Punjab | 28.87 | 29.35 |
| Rajasthan | 31.24 | 30.48 |
| Sikkim | 53.18 | 46.60 |

Contd.

| India/State/Union Territory | 1971 | 1981 |
|---|---|---|
| Tamil Nadu | 35.78 | 39.30 |
| Tripura | 27.79 | 29.64 |
| Uttar Pradesh | 30.94 | 29.22 |
| West Bengal | 27.91 | 28.26 |
| UNION TERRITORY | | |
| Andaman and Nicobar Islands | 39.55 | 33.21 |
| Arunachal Pradesh | 57.65 | 49.61 |
| Chandigarh | 33.29 | 23.69 |
| Dadra and Nagar Haveli | 47.17 | 40.81 |
| Delhi | 30.21 | 31.93 |
| Gao,Daman and Diu | 31.67 | 30.59 |
| Lakshadweep | 26.15 | 19.74 |
| Mizoram | 45.61 | 41.73 |
| Pondicherry | 29.80 | 28.66 |

* Excludes Assam and Areas under unlawful occupation of Pakistan and China.

SOURCE : *Primary Census Abstract, Series-1, India, Part III B(i), 1971 and 1981.*

chromite probably led to a higher proportion of workers. The states of Karnataka and Maharashtra might be owing their high proportion of workers mainly to cultivation of labour intensive crops, chiefly cotton. Madhya Pradesh had a large tribal population[1]. Their primitive subsistence economy requiring participation of maximum number of family members and almost no taboos against female participation in work might have been mainly responsible for high proportion of workers. Further, setting up of a steel plant (Bhilai), a cement plant (Bhilai), a paper mill (Bilaspur) and extensive mining activities in the region might have led to a high participation rate. A number of household industries such as weaving of cotton cloth on handloom, basket making, tanning etc. probably worked in the same direction[2].

In Tamil Nadu mining of lignite (Salem district), cultivation of labour intensive crops such as sugar-cane,rice, tobacco, tea and development of cotton spinning and cotton textile (Coimbatore

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1. *Gupta, S.C.: "Spatial Patterns of Working Force in India", 1971. Unpublished dissertation submitted to the Panjab University, Department of Geography, 1981.*

2. *Ibid, p.14*

and Madurai districts) might have been responsible for high proportion of workers[3].

The hilly north-east with a high proportion of tribal population which places an emphasis on high dignity of labour[4], difficult mountainous terrain and tough climate demanding participation of maximum family members for even seeking out a living and development of household industries based on wood and products of abundant forests were, perhaps, responsible for a high proportion of workers. Sikkim, though not contiguous, and without any tribal population, had high proportion probably for similar reasons.

Himachal Pradesh formed another area of high proportion of working population. The reasons for this have been discussed later in this chapter.

Thus, a high proportion of population in workforce was probably associated with high proportion of tribal population, high proportion of scheduled caste population and high proportion of area under

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3. *Ibid, p.15*

4. *Acharya, S.K.:"Agriculture in Meghalaya, Mizoram and Mikir and North Cachar Hills", Artha Vijnana, Vol.16, No.1, P.50, 1974.*

labour intensive crops. In certain areas large scale mining and existence of household industries perhaps led to the same results.

## Areas of Low Participation Rate:

The single largest area of low WRPs covered Jammu and Kashmir, Punjab, Haryana, Rajasthan, Gujrat, Uttar Pradesh, Bihar, West Bengal and Orissa. In this area very low female work participation rate was perhaps, the chief cause of low proportion of workers. In Jammu and Kashmir majority of the population is Muslim, with very strong bias against female participation in work outside home. Among Jats in Punjab, Haryana, parts of Uttar Pradesh and Rajputs and Jats in Rajasthan, taboos against female participation in work are almost equally strong and might be leading to low proportion of workers. A Jat Sikh farmer considers it below his dignity for his women folk to take part in work[5].

In Gujarat, the low proportion of workers was, perhaps, due to high literacy rate and diversification of economy. Kerala also had low proportion of workers It might be due to high literacy rates. In Assam the low proportion of workers might have been due to a

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5. *Chandna R.C.: "Female Working Force of Rural Punjab-1961", Manpower Journal, Vol. II, No.4, pp.42-62, 1967.*

sizeable part of the state's population being Muslim which greatly discourages female participation in work outside home. West Bengal had low proportion of workers probably due to great diversification of its economy, greater urbanisation and high literacy rate.

The low proportion of population in workforce may be explained in terms of strong taboos against females taking part in work outside home, high literacy rates, high diversification of economy and high degree of urbanisation.

The above discussion brought out some of the variables that might have been responsible for high or low proportion of workers in India. However, the effect of variables outlined was not correlated to WPR using some statistical technique, rather it was a generalised discussion of the pattern of WPR in India as to its causes. The following analysis, in the context of north-west India, studies the pattern of WPR in 1971 and 1981 as to its causes, correlating the proportion of workers to certain explanatory variables. And for this purpose the statistical tool of zero-order correlation was applied.

## Inter-Regional Pattern of Workforce Participation in North-West India:

### At State Level:

The present study is based on the total work participation in north-west India. Here the participation rate (29.8 per cent in 1971 and 30 per cent in 1981 censuses) was below the national average (33* per cent in 1971 and 33.4 per cent in 1981). At the inter-state level, Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana and Rajasthan show wide divergence in the proportion of workers. In 1971, it was highest in Himachal Pradesh (37 per cent) and lowest in Haryana (22 per cent). While the workforce participation rates in Himachal Pradesh and Rajasthan were above the regional average of 30 per cent in 1981 in Jammu and Kashmir, Punjab and Haryana the workforce participation rates were well below the regional average of north-west India as a whole (Table 2 and 3).

In 1981, there was not much change in the pattern. While Himachal Pradesh continued to remain at the top, Haryana stayed at the bottom position.

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* *excluding Assam and areas under unlawful occupation of Pakistan and China.*

## TABLE - 3

Proportion of Main Workers (in per cent) to Total Population in North-West India and States, 1971 and 1981.

| Region/State | | 1971 | | | 1981 | | |
|---|---|---|---|---|---|---|---|
| | | P | M | F | P | M | F |
| N.W.India | T | 29.84 | 51.46 | 6.07 | 30.06 | 50.65 | 7.24 |
| | R | 30.79 | 52.47 | 6.69 | 30.61 | 51.18 | 6.12 |
| | U | 26.84 | 53.69 | 3.31 | 28.12 | 48.77 | 4.30 |
| Jammu & Kashmir | T | 29.75 | 52.49 | 3.86 | 30.37 | 52.19 | 5.90 |
| | R | 30.50 | 53.74 | 4.17 | 30.76 | 52.85 | 6.11 |
| | U | 26.47 | 47.11 | 2.46 | 28.92 | 49.75 | 5.11 |
| Himachal Pradesh | T | 36.95 | 52.43 | 20.79 | 34.36 | 49.58 | 18.71 |
| | R | 37.15 | 52.25 | 21.68 | 34.38 | 49.22 | 19.98 |
| | U | 34.20 | 54.52 | 7.05 | 34.08 | 53.55 | 9.58 |
| Punjab | T | 28.87 | 52.82 | 1.17 | 29.35 | 53.14 | 2.26 |
| | R | 29.11 | 53.74 | 0.71 | 29.29 | 53.66 | 1.78 |
| | U | 28.10 | 49.87 | 2.66 | 29.50 | 51.80 | 3.89 |
| Haryana | T | 22.44 | 47.26 | 2.41 | 28.35 | 48.94 | 4.69 |
| | R | 26.47 | 47.49 | 2.28 | 28.20 | 48.63 | 4.88 |
| | U | 26.30 | 46.18 | 2.99 | 28.81 | 50.01 | 3.98 |
| Rajasthan | T | 31.20 | 52.10 | 8.30 | 30.47 | 49.91 | 9.32 |
| | R | 32.40 | 53.60 | 9.30 | 31.52 | 51.01 | 10.58 |
| | U | 25.80 | 45.10 | 3.90 | 26.54 | 45.92 | 4.44 |

*SOURCE* : *General Economic Tables, Part II-B and Part III A and B for 1971 and 1981 censuses respectively.*

There was an increase in the workforce participation rates over the decade 1971-81. In Jammu and Kashmir (from 29.7 per cent to 30.3 per cent), Punjab (from 28.8 per cent to 29.3 per cent) and Haryana (from 22.4 per cent to 28.3 per cent). But, in Himachal Pradesh and Rajasthan the workforce participation rates decreased over the decade 1971-81 (from 36.9 per cent to 34.3 per cent and from 31.2 per cent to 30.4 per cent respectively)(Table-3).

## At District Level:

Exhibiting the same pattern of regional disparity observed in north-west India, there has also been wide inter-district differentials in workfornce participation rate. In 1981, Lahul and Spiti had highest proportion of workers (59 per cent), while Una had lowest workforce participation rate (23 per cent), both the districts being in Himachal Pradesh.

Keeping in view the regional average of work-force participation (29.8 per cent in 1971 and 30 per cent in 1981), the different parts of the region were grouped into two main categories viz. areas having high proportion of workers and areas having low proportion of workers. These two main categories were further subdivided into two sub-categories each. The approach

followed for this purpose was that the data were arranged in a descending order. The value of each quarter of the total observations was noted and a round figure to such values was considered as a cutting point to form the different categories. The main and the sub-categories thus formed were as follows:

A) Areas of high proportion of workers where they account for more than 30.00 per cent of total population as main workers. They were further sub-divided into:

   i) areas having high proportion of workers above 32.00 per cent and

   ii) areas having medium proportion of workers within the range of 30.00 per cent to 32.00 per cent.

B) Areas of low proportion of workers where they constitute less than 30.00 per cent of total population as main workers. They are also further sub-divided into:

   i. areas having low proportion of workers within the range of 28.00 per cent to 30.00 per cent and

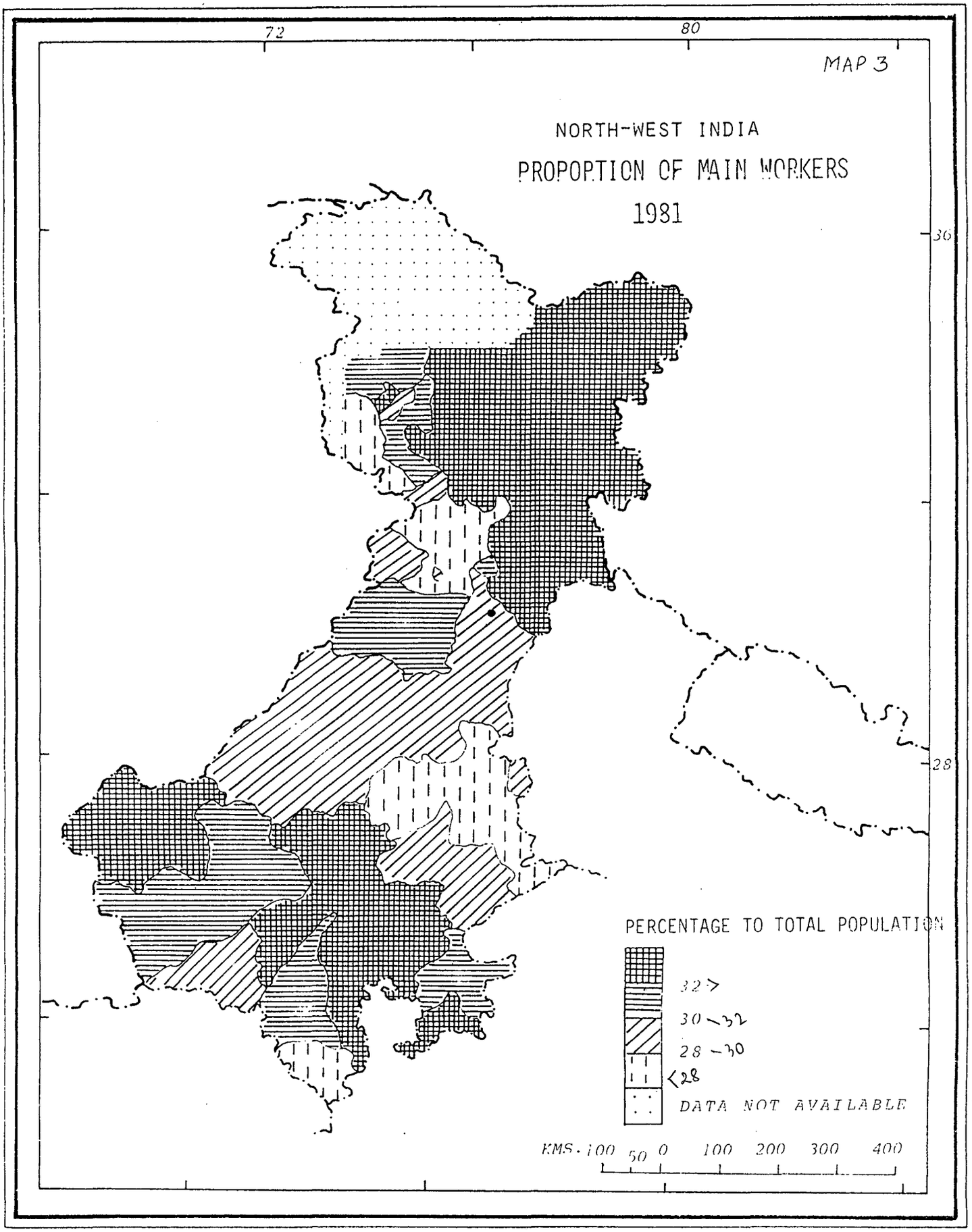
   ii) areas having very low proportion of workers below 28.00 per cent.

It is to be pointed out here that the same approach as utilised while formulating the above categories, has been followed to make different categories to analyse the pattern of other aspects of working population viz. workforce participation rate within working age-group, rural/urban workforce participation rate and male/female workforce participation rate.

## Areas of High Participation Rate:

Broadly speaking, most of the districts in the eastern parts of the west Himalayan sub-region and some districts in the cental, western and south-eastern parts of Rajasthan desert and uplands had high proportion of workers. Further, to be more specific, the cental and eastern districts of Jammu and Kashmir and cental, northern and south-eastern district of Himachal Pradesh formed a single largest contiguous area which exhibited a high percentage of workforce to total population. Another such area was in the south of the region comprising the cental and south - eastern districts of Rajasthan. However, it was interrupted by few pockets of lower proportion of workers. In eastern Rajasthan, Jaisalmer district also had high proportion of workers.

(Map 3, Table 4).


72
80
MAP 3
NORTH-WEST INDIA
PROPOPTION OF MAIN WORKERS
1981
36
28
PERCENTAGE TO TOTAL POPULATION
32 >
30 – 32
28 – 30
< 28
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

## TABLE - 4

Proportion of Main Workers (in per cent) to Total Population in Districts of North-West India, 1971 and 1981

| Districts | 1971 | 1981 |
|---|---|---|
| Anantnag | 31.10 | 31.67 |
| Pulwama | * | 29.04 |
| Srinagar | 28.87 | 30.12 |
| Badgam | * | 32.80 |
| Baramula | 31.05 | 31.42 |
| Kupwara | * | 30.37 |
| Kargil | * | 45.32 |
| Ladakh (Leh) | 43.76 | 43.54 |
| Doda | 36.08 | 40.53 |
| Udhampur | 31.19 | 31.62 |
| Kathua | 26.71 | 28.82 |
| Jammu | 24.44 | 26.65 |
| Rajauri | 27.65 | 27.58 |
| Punch | 27.77 | 27.72 |
| Chamba | 40.32 | 35.11 |
| Kangra | 27.46 | 26.67 |
| Hamirpur | * | 24.71 |
| Una | * | 23.49 |

Contd.

| Districts | 1971 | 1981 |
|---|---|---|
| Bilaspur | 40.53 | 31.79 |
| Mandi | 39.58 | 37.42 |
| Kullu | 48.63 | 45.08 |
| Lahul and Spiti | 64.74 | 59.08 |
| Mahasu*/Shimla | 47.13 | 46.40 |
| Shimla*/Solan | * | 34.51 |
| Sirmaur | 42,47 | 40.21 |
| Kinnaur | 60.51 | 54.66 |
| Gurdaspur | 26.42 | 26.56 |
| Amritsar | 29.13 | 29.64 |
| Firozepur | 29.90 | 30.49 |
| Ludhiana | 29.57 | 30.38 |
| Jalandhar | 27.10 | 27.98 |
| Kapurthala | 27.77 | 28.56 |
| Hoshiarpur | 26.19 | 26.38 |
| Ropar/Rupnagar | 28.06 | 28.82 |
| Patiala | 29.36 | 29.90 |
| Sangrur | 31.32 | 31.47 |
| Bhatinda | 30.73 | 30.84 |
| Faridkot | * | 30.20 |
| Ambala | 27.37 | 29.02 |
| Kurukshetra | * | 28.67 |
| Karnal | 27.04 | 29.07 |

Contd.

| District | 1971 | 1981 |
|---|---|---|
| Jind | 26.72 | 29.24 |
| Sonipat | * | 28.21 |
| Rohtak | 23.65 | 26.70 |
| Faridabad | * | 29.42 |
| Gurgaon | 26.11 | 27.79 |
| Mahendragarh | 25.60 | 23.61 |
| Bhiwani | * | 28.09 |
| Hisar | 28.18 | 29.96 |
| Sirsa | * | 29.74 |
| Ganganagar | 28.80 | 29.48 |
| Bikaner | 28.90 | 29.31 |
| Churu | 30.10 | 29.49 |
| Khunjhunun | 25.30 | 25.03 |
| Alwar | 28.00 | 26.72 |
| Bharatpur | 28.90 | 27.27 |
| Swai Madhopur | 32.30 | 28.86 |
| Jaipur | 30.40 | 29.36 |
| Sikar | 26.90 | 24.62 |
| Ajmer | 34.80 | 35.83 |
| Tonk | 33.90 | 33.87 |
| Jaisalmer | 31.70 | 32.08 |
| Jodhpur | 30.30 | 30.59 |
| Nagaur | 34.00 | 33.10 |
| Pali | 32.20 | 32.06 |
| Barmer | 34.10 | 31.85 |

Contd.

| District | 1971 | 1981 |
|---|---|---|
| Jalor | 31.50 | 29.40 |
| Sirohi | 29.80 | 29.45 |
| Bhilwara | 39.30 | 38.50 |
| Udaipur | 32.00 | 30.13 |
| Chittaurgarh | 38.70 | 37.81 |
| Dungarpur | 27.90 | 27.19 |
| Banswara | 28.00 | 27.97 |
| Bundi | 33.10 | 33.93 |
| Kota | 30.90 | 30.40 |
| Jhalawar | 31.90 | 35.95 |

* after 1971.

** Refer to 1971 name of the District.

*SOURCE : As in Table 3.*

## Areas of Medium Participation Rate:

The southern districts in Punjab lying to the north-west of Haryana had medium proportion of workers. Another such area was in the central and north-western Jammu and Kashmir. Further, few districts in south-western and south-eastern Rajasthan and one in Himachal Pradesh formed scattered pockets having medium range of workforce participation rate. (Map 3, Table 4).

The causal factors for high or medium proportion of workers in the different states of the region were outlined following the statistical technique of zero-order correlation. It was found that in Jammu and Kashmir and Himachal Pradesh, the high proportion of female workers and proportion of irrigated area were mainly responsible for high workforce participation rate. In Punjab and Haryana the causal factors of high workforce participation rate (WPR) were, by and large, proportion of irrigated area, proportion of workers in primary sector and proportion of area sown more than once. In Rajasthan, proportion of scheduled caste population and proportion of female workers were among the important factors causing high WPR. (Table 20).

## Areas of Low Participation Rate:

Most of the districts in Haryana, few in Punjab and the north-western Rajasthan formed a single largest contiguous area having low proportion of workers. Further,there were few scattered pockets in Jammu and Kashmir, Punjab and Rajasthan which had low WPR.

(Map 3, Table 4).

## Areas of Very low Participation Rate:

The north-eastern Rajsthan and south - western Haryana formed a contiguous area which had very low proportion of workers. Another such area was in the north-eastern Punjab and south - western Himachal Pradesh. Further, the western districts of Jammu and Kashmir and two districts in extreme south of Rajasthan also had very low proportion of workers.

(Map 3, Table 4).

The causal factors of low or very low proportion of workers in Jammu and Kashmir and Himachal Pradesh were dependency ratio and literacy rate which had a negative correlation with WPR. In Punjab and Haryana such factors were dependency ratio, literacy

rate, sex-ratio and degree of urbanisation. In Rajasthan, by and large, dependency ratio and literacy rate had caused low proportion of workers. (Table 20).

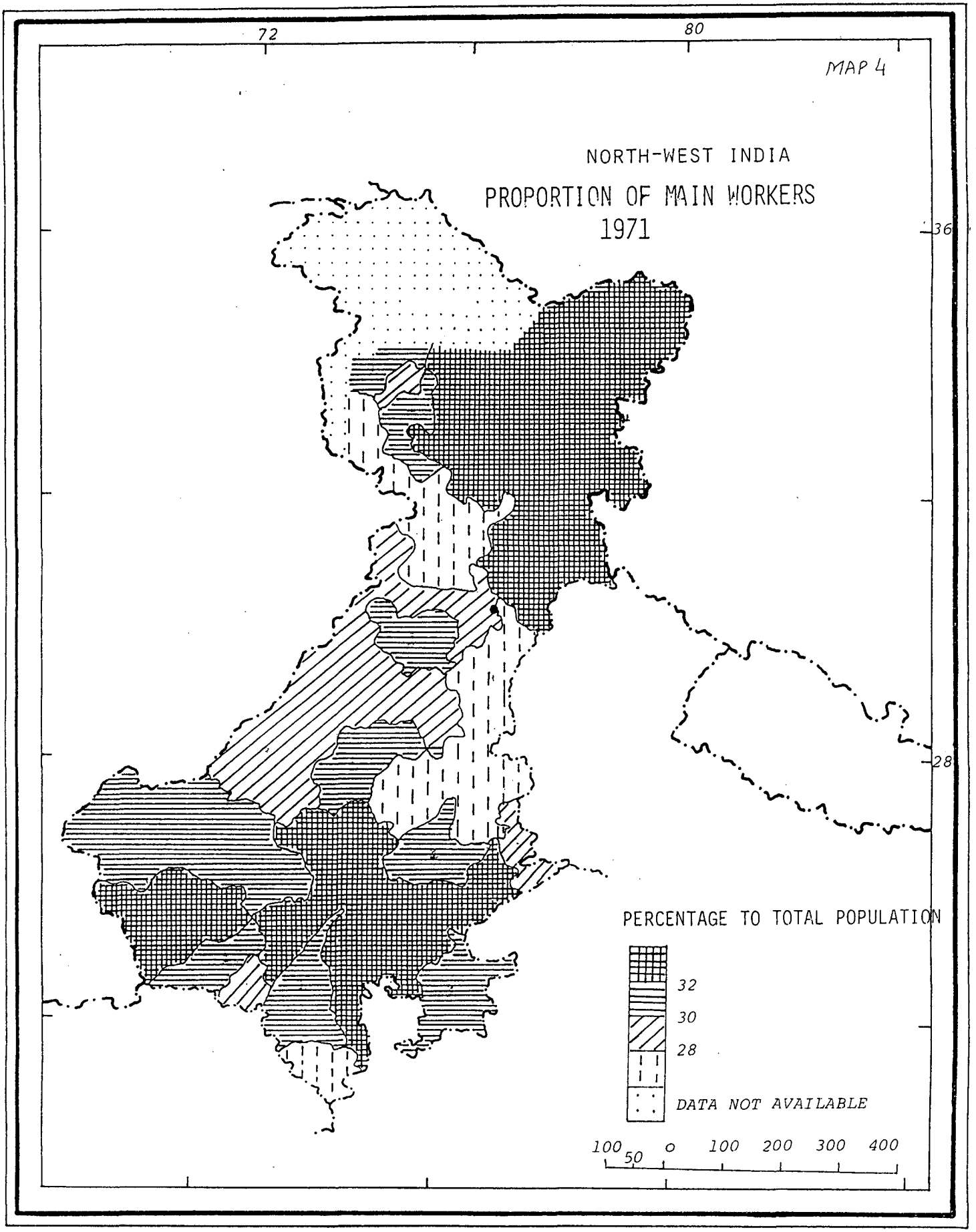
In 1971, pattern of WPR was not much different from that of 1981. However, the western districts in Haryana had lower proportion of workers in 1971 and it had increased over the decade 1971-81. Other such changes in the pattern of workforce participation rate during 1971-81 become explicit when maps 3 and 4 are compared. The pattern of workforce participation rate in 1971 is shown in map 4.

(Map 4, Table 3).

## Workforce Participation Rate in Working Age-Group (15-59)

In what follows, the proportion of workers within working age-group has been analysed with a view to avoid the impact of high fertility rate on the proportion of total workers.

The proportion of main workers to total population was a little below one-third (30 per cent in 1981) in the north-west region of India, whereas the proportion of workers in the working age-group


72
80
MAP 4
NORTH-WEST INDIA
PROPORTION OF MAIN WORKERS
1971
36
28
PERCENTAGE TO TOTAL POPULATION
32
30
28
DATA NOT AVAILABLE
100 50 0 100 200 300 400

was 50 per cent in 1981. The low proportion of total workers to total population is to be viewed in the context of the phase of demographical cycle. India is still in the later phase of the second stage of demographic transition characterised by high fertility rates and low death rates, thereby implying a high proportion of population in non-working age-groups viz. 0-15 and above 60. This causes a decrease in proportion of total workers since while computing TWPR, the denominator includes a high proportion of population in the non-working age-groups. Child and old-age workforce participation does not compensate for their high proportions in the total population and, hence, there is a wide gap between TWPR and percentage of workers in the working age-group.

## Inter-District Pattern of Proportion of Workers within Working Age-Group (15-59):

The highest proportion of workers in the working age-group was in Lahul and Spiti (85 per cent) and it was lowest (38 per cent) in Una, both the districts being in Himachal Pradesh. Considering the regional average of workforce participation in working age-group (50 per cent) and following the approach discussed earlier in this chapter, the two main

categories further bifurcated into sub-categories are as below:

A) Areas of high proportion of workers in the working age-group, where they account for more than 50 per cent of the population in the age-group 15-59 as main workers, further bifurcated into:

i. areas having very high proportion of workers, above 54 per cent and

ii. areas having high proportion of workers within the range of 50 to 54 per cent.

B) Areas of low proportion of workers in the working age-group where they constitute less than 50 per cent of the population in the working age-group 15-59 as workers. This was further bifurcated into two sub-categories:

i. areas having medium proportion of workers within the range of 46 per cent to 50 per cent and

ii. areas having low proportion of workers below 46 per cent.

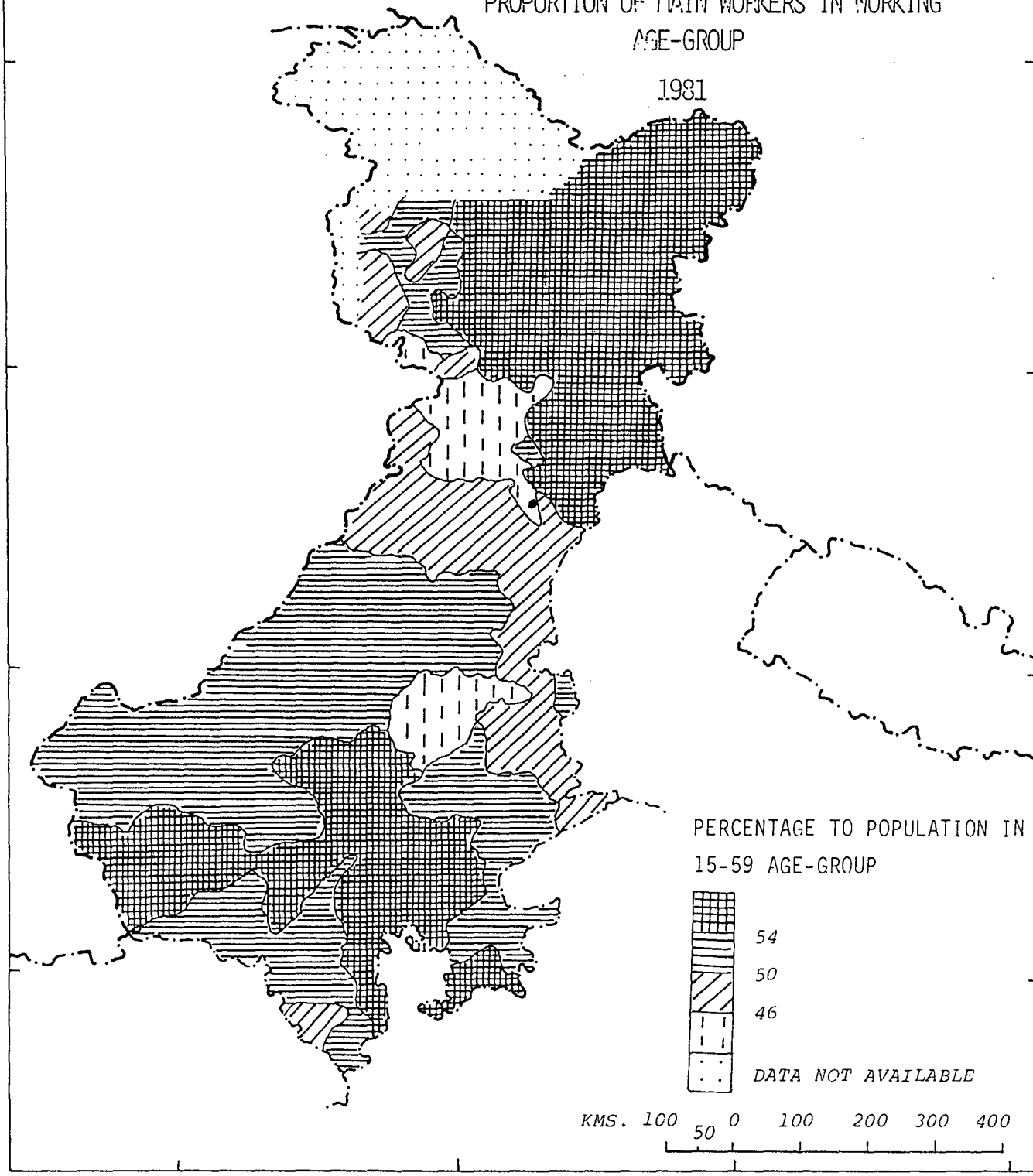
Before analysing the pattern of WPR in working age-group, it is noteworthy that when the

MAP 5

NORTH-WEST INDIA

PROPORTION OF MAIN WORKERS IN WORKING AGE-GROUP

1981



# TABLE - 5

Proportion of Main Workers (in per cent) in Working Age-group (15-59) to Population (15-59) North-West India, 1981

| State/District | Per Cent Main Workers (15 -59) |
|---|---|
| JAMMU AND KASHMIR | 49.39 |
| Anantnag | 51.77 |
| Pulwama | 48.50 |
| Srinagar | 46.67 |
| Badgam | 50.58 |
| Baramula | 50.90 |
| Kupwara | 49.95 |
| Kargil | 68.61 |
| Leh (Ladakh) | 66.19 |
| Doda | 55.86 |
| Udhampur | 52.11 |
| Kathua | 47.16 |
| Jammu | 43.67 |
| Rajauri | 47.19 |
| Punch | 46.47 |
| HIMACHAL PRADESH | 56.18 |
| Chamba | 56.44 |
| Kangra | 44.33 |
| Hamirpur | 42.57 |
| Una | 38.38 |

Contd.

| State/District | Per Cent Main Workers (15 - 59) |
|---|---|
| Bilaspur | 53.53 |
| Mandi | 62.61 |
| Kullu | 71.13 |
| Lahul and Spiti | 84.60 |
| Shimla | 71.54 |
| Solan | 56.60 |
| Sirmaur | 63.08 |
| Kinnaur | 83.51 |
| PUNJAB | 46.56 |
| Gurdaspur | 43.30 |
| Amritsar | 47.05 |
| Firozepur | 49.00 |
| Ludhiana | 47.19 |
| Jalandhar | 44.76 |
| Kapurthala | 45.77 |
| Hoshiarpur | 41.78 |
| Rupnagar | 45.47 |
| Patiala | 47.34 |
| Sangrur | 48.75 |
| Bhatinda | 48.86 |
| Faridkot | 48.05 |
| HARYANA | 48.31 |
| Ambala | 46.81 |
| Kurukshetra | 47.79 |

Contd.

| State/District | Per Cent Main Workers (15 - 59) |
|---|---|
| Karnal | 48.83 |
| Jind | 50.15 |
| Sonipat | 48.17 |
| Rohtak | 46.50 |
| Faridabad | 50.45 |
| Gurgoan | 48.31 |
| Mahendragarh | 41.73 |
| Bhiwani | 50.17 |
| Hisar | 50.90 |
| Sirsa | 50.34 |
| RAJASTHAN | 52.19 |
| Ganganagar | 50.66 |
| Bikaner | 50.41 |
| Churu | 51.76 |
| Jhunjhunun | 44.87 |
| Alwar | 47.21 |
| Bharatpur | 48.12 |
| Swai Madhopur | 50.23 |
| Jaipur | 50.24 |
| Sikar | 44.46 |
| Ajmer | 56.65 |
| Tonk | 55.78 |
| Jaisalmer | 53.77 |
| Jodhpur | 52.35 |
| Nagaur | 57.36 |

Contd.

| State/District | Per Cent Main Workers (15 - 59) |
|---|---|
| Pali | 61.87 |
| Barmer | 54.59 |
| Jalor | 52.55 |
| Sirohi | 50.56 |
| Bhilwara | 16.34 |
| Uadipur | 50.71 |
| Chittaurgarh | 61.77 |
| Dungurpur | 46.35 |
| Banswara | 50.07 |
| Bundi | 56.57 |
| Kota | 51.76 |
| Jhalawar | 61.02 |

*SOURCE : Economic Tables,Part III A and B, 1981.*

map 3 showing TWPR and map 5 showing WPR in working age-group are compared, there is a substantial increase in the number of districts falling in the high proportion of workers category and the pattern that emerges when the WPR in working age-group is considered, forms more clearcut contiguous areas of high or low proportion of workers.

## Areas of Very High Participation Rate of Workers in the Working Age-Group (15-59):

The north-eastern and south-western parts of the region exhibited very high WPR in working age-group. In Jammu and Kashmir, such areas were lying to the east of Anantnag forming a contiguous area with most of the districts in Himachal Pradesh except those in the south - east. Another large area having very high WPR in working age-group was lying in the central, south-western and south-eastern parts of Rajasthan.

(Map 5, Table 5).

## Areas of High Participation Rate of Workers in the Working Age-Group (15-59):

In Rajasthan, most of the districts along the international boundry of Pakistan and western

districts of Haryana formed a single largest contiguous area of high WPR in working age-group. Further, there were some scattered pockets in south-east and south-west Rajasthan, Haryana, Himachal Pradesh, and north-western Jammu and Kashmir showing high proportion of workers in working age-group.

(Map 5, Table 5).

## Areas having Medium Participation Rate of Workers in Working Age-Group (15-59):

The districts lying to the south of Jalandhar in Punjab and those in northern and eastern Haryana and north-western Rajasthan formed a contiguous area of medium WPR in working age-group. Further, there were some scattered pockets in western Jammu and Kashmir which exhibited medium WPR in working age-group

(Map 5, Table 5).

## Areas of Low Participation Rate of Workers in Working Age-Group (15-59):

The north-eastern Punjab and south-western Himachal Pradesh formed a contiguous area of low WPR in working age-group. Another such small area was in the north-west Rajasthan.

(Map 5, Table 5).

## Rural-Urban Differentials:

In India, as per the 1971 census, 34 per cent of its rural and 29 per cent of its urban population was at work. The rural-urban disparity was also observed in the region viz. north-west India, as 31 per cent of its rural and 27 per cent of its urban population was at work at that time. As per the 1981 census, the corresponding figures were 31 per cent and 28 per cent for rural and urban areas respectively.

At the state level in north-west India, the rural-urban disparity was highest in Rajsthan in both the censuses. In 1971, the workforce participation rates in the state were 32 per cent in rural areas and 26 per cent in urban areas respectively. However, the rural-urban disparity showed a decreasing trend over the decade 1971-81 in Rajasthan. As per 1981 census, the corresponding figures were 31 per cent and 26 per cent for rural and urabn areas respectively. In 1971, Jammu and Kashmir had 30 per cent of its rural and 26 per cent of its urban population in work-force. In 1981, the workforce particpation rates were 31 per cent and 29 per cent for rural and urabn areas respectively, showing a decreasing rural-urban

disparity over the decade. In 1971, Himachal Pradesh had 37 per cent of its rural and 34 per cent of its urban population in workforce. In 1981, the rural-urban disparity almost disappeared with workforce participation rate of 34.3 per cent for rural areas and 34 per cent for urban areas respectively. The rural-urban differentials showed a decreasing trend in Punjab and Haryana also. In 1971, the workforce participation rates in Punjab were 29 per cent and 28 per cent for rural and urban areas respectively. The corresponding figure in 1981 were 29.2 per cent and 29.5 per cent respectively. In Haryana, according to 1971 census, 26.5 per cent of its rural and 26.3 per cent of its urban population was included in the workforce. In 1981, the corresponding figures were 28.2 per cent and 28.8 per cent respectively. It is obvious from the above discussion that in India and in all the states of north-west India, the proportion of workers in rural areas was higher than its urban counterpart, except in the states of Punjab and Haryana where it was other way round. (Table 3 )

Rural population is primarily dependent upon agriculture. But agriculture in India is still, by and large, non-mechanised and subsistence in nature.

Thus, it requires participation by maximum number of persons to perform chores connected with it. The nature of chores is such that their performance requires no skill. This, by attracting workers at an earlier age, pushes up the proportion of workers in rural areas. In urban areas on the other hand, most jobs require education and/or specialised skills which take long to acquire, thus delaying entry in workforce. This lowers the proportion of workers in urban areas.

Literacy rate of rural population is low as compared to its urban counterpart. This is due to meagre financial resources and lack of appreciation of the value of education on the part of the parents in rural areas. The result is that rural children either do not go to school or drop out early. This encourages persons to take up work at an early age raising the proportion of workers to total population. In urban areas, however, due to their better financial position and recognition of the importance of education parents send their children to schools and institutions of higher education. This, by delaying entry into workforce, lowers the urban work participation rates.

Further, the females in rural areas find it quite easy to secure jobs in the rural sector. As

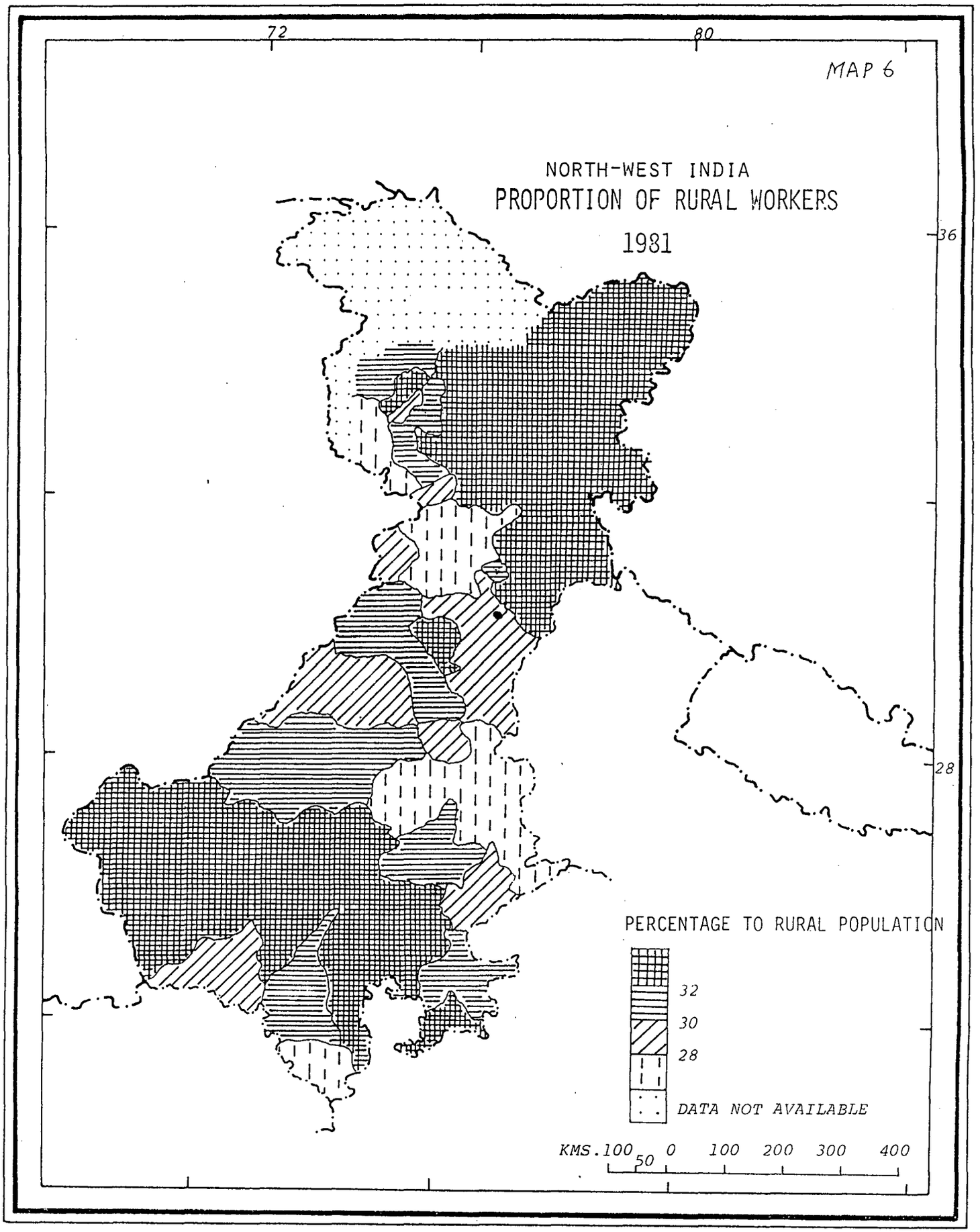
stated earlier, no special skill is required to perform various agricultural operations. Further they can carry their infants to the place of work itself. Hence the participation rates of rural females are higher as compared to its urban counterpart.

The participation rates in rural areas would have been still higher and the rural-urban disparity would have been even more but for some out-migration from rural to urban areas. As this out-migration is age selective, it decreases the proportion of workers in rural areas and increases it in urban areas. Urban areas with their diversified economy, offer the south-western, central and south-eastern districts showed high proportion of workers in rural areas.

(Map 6, Table 6).

The single largest contiguous area which showed low workforce participation rate in rural areas (below 30 per cent), included all the districts of Haryana(except Hisar) and the adjoining districts of Rajasthan. Another such area included the districts in south - west of Jammu and Kashmir and Himachal Pradesh and north-east of Punjab. Few districts in the southern Rajasthan also formed scattered pockets exhibiting low proportion of workers in rural areas.

(Map 6, Table 6).


72
80
MAP 6
NORTH-WEST INDIA
PROPORTION OF RURAL WORKERS
1981
36
28
PERCENTAGE TO RURAL POPULATION
32
30
28
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

## TABLE - 6

Proportion of Main Workers (in per cent) in Rural/Urban Areas to Population in Rural/Urban Areas, North-West India, 1981.

| Districts | Rural | Urban |
|---|---|---|
| Anantnag | 31.93 | 29.51 |
| Pulwama | 29.10 | 28.42 |
| Srinagar | 33.23 | 29.36 |
| Badgam | 33.54 | 28.34 |
| Baramula | 31.77 | 29.21 |
| Kupwara | 30.38 | 29.82 |
| Kargil | 45.58 | 40.82 |
| Leh( Ladakh ) | 43.27 | 45.42 |
| Doda | 33.75 | 29.02 |
| Udhampur | 31.87 | 29.20 |
| Kathua | 28.93 | 28.00 |
| Jammu | 26.34 | 27.40 |
| Rajauri | 27.41 | 30.76 |
| Punch | 27.87 | 25.37 |
| Chamba | 35.38 | 31.47 |
| Kangra | 26.48 | 30.27 |
| Hamirpur | 24.37 | 31.25 |
| Una | 23.24 | 26.37 |
| Bilaspur | 31.72 | 33.23 |
| Mandi | 37.85 | 31.95 |

Contd.

| Districts | Rural | Urban |
|---|---|---|
| Kullu | 45.66 | 37.55 |
| Lahul and Spiti | 59.08 | - |
| Shimla | 47.34 | 41.37 |
| Solan | 34.31 | 36.22 |
| Sirmaur | 41.26 | 29.33 |
| Kinnaur | 54.66 | - |
| Gurdaspur | 26.49. | 26.82 |
| Amritsar | 29.65 | 29.62 |
| Firozepur | 31.04 | 28.65 |
| Ludhiana | 29.62 | 31.44 |
| Jalandhar | 27.47 | 28.93 |
| Kapurthala | 27.95 | 30.00 |
| Hoshiarpur | 26.06 | 28.29 |
| Rupnagar | 28.46 | 30.11 |
| Patiala | 29.99 | 29.69 |
| Sangrur | 32.15 | 29.17 |
| Bhatinda | 30.99 | 30.32 |
| Faridkot | 30.66 | 28.74 |
| Ambala | 29.06 | 28.95 |
| Kurukshetra | 28.75 | 28.26 |
| Karnal | 28.77 | 29.91 |
| Jind | 29.57 | 27.16 |
| Sonipat | 28.31 | 27.75 |
| Rohtak | 26.78 | 26.38 |
| Faridabad | 27.31 | 32.49 |
| Grugoan | 28.00 | 26.93 |

Contd.

| Districts | Rural | Urban |
|---|---|---|
| Manhendragarh | 23.21 | 24.79 |
| Bhiwani | 28.14 | 27.86 |
| Hisar | 30.18 | 29.03 |
| Sirsa | 29.84 | 29.32 |
| Ganganagar | 28.72 | 28.53 |
| Bikaner | 31.74 | 25.58 |
| Churu | 31.91 | 23.63 |
| Jhunjhunun | 25.65 | 22.68 |
| Alwar | 26.78 | 26.24 |
| Bharatpur | 27.68 | 25.29 |
| Swai Madhopur | 29.44 | 25.08 |
| Jaipur | 30.70 | 27.04 |
| Sikar | 25.34 | 21.75 |
| Ajmer | 41.91 | 27.70 |
| Tonk | 35.09 | 28.42 |
| Jaisalmer | 32.36 | 30.33 |
| Jodhpur | 32.85 | 26.34 |
| Nagaur | 34.39 | 25.55 |
| Pali | 33.01 | 27.86 |
| Barmer | 32.32 | 26.94 |
| Jalor | 29.72 | 25.81 |
| Sirohi | 29.95 | 27,13 |
| Bhilwara | 40.15 | 28.67 |
| Udaipur | 30.56 | 27.72 |
| Chittaurgarh | 39.21 | 28.56 |

Contd.

| Districts | Rural | Urban |
|---|---|---|
| Dungarpur | 27.43 | 23.61 |
| Banswara | 27.98 | 27.73 |
| Bundi | 35.53 | 26.12 |
| Kota | 31.50 | 28.06 |
| Jhalawar | 37.21 | 26.42 |

*SOURCE* : *As in Table 5.*

The factors responsible for high proportion of workers in rural areas in 1981 were proportion of irrigated area, proportion of workers in primary sector and proportion of female workers. For low WPR in rural areas the causal factors were dependency ratio, sex-ratio, and literacy rates.

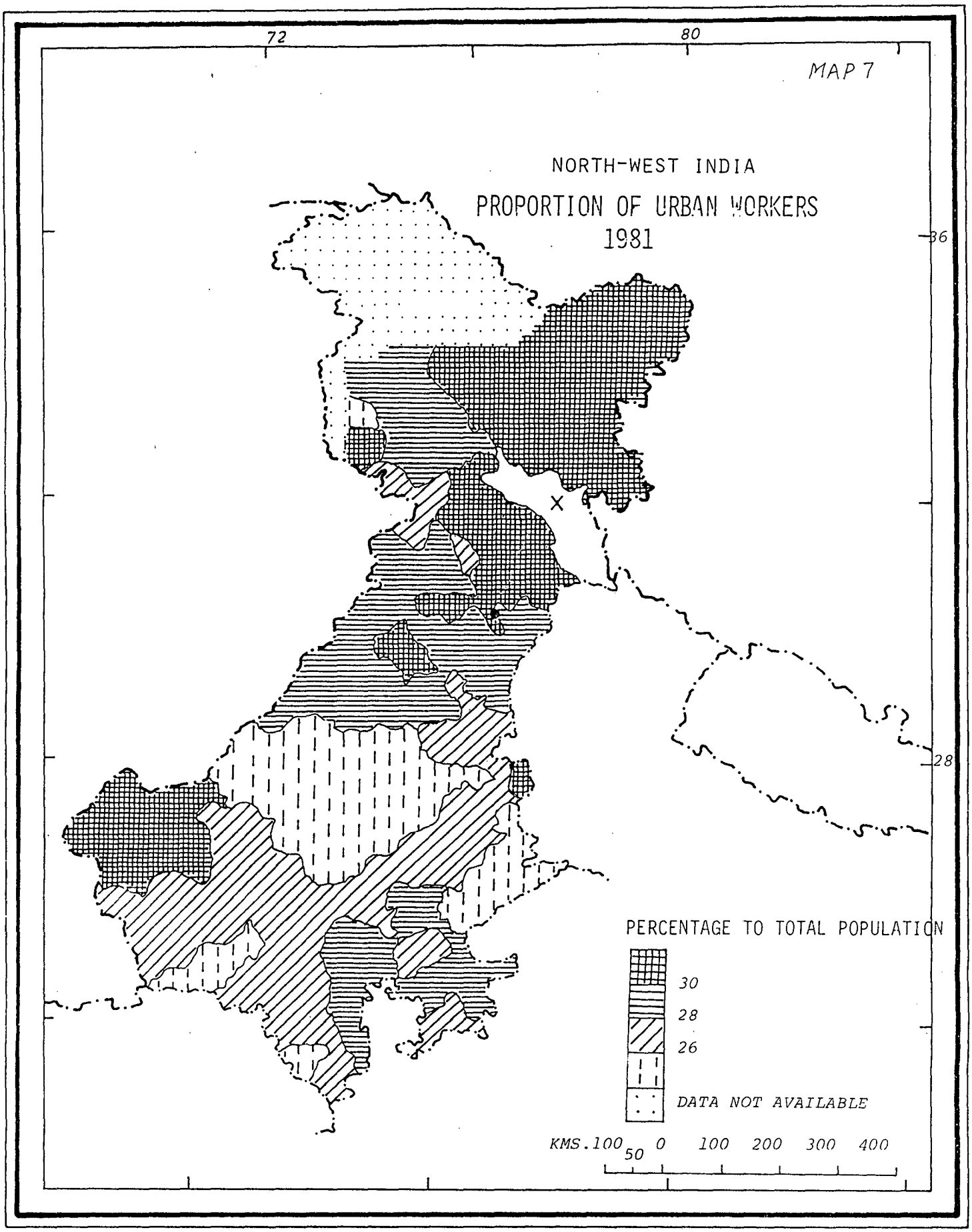
(Table 21).

## Inter-District Pattern of Urban Workforce Participation Rate:

The pattern of workforce participation in urban areas showed marked changes from that of aggregate proportion of workers. The line drawn by joining the northern boundaries of Bikaner, Churu, Bhiwani, Jind and Sonipat was the main dividing line. Broadly speaking, to its north, all the districts had high proportion of workers in urban areas (above 28 per cent) and the highest being 45 per cent in Ladakh. However, Kathua, Jammu and Punch in Jammu and Kashmir; Una in Himachal Pradesh and Gurdaspur in Punjab were the only exceptions which had low proportion of workers in urban areas (below 28 per cent).

(Map 7, Table 6).

To the south of the line, all the districts had low proportion of workers in urban areas(below


72
80
MAP 7
NORTH-WEST INDIA
PROPORTION OF URBAN WORKERS
1981
36
28
PERCENTAGE TO TOTAL POPULATION
30
28
26
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

28 per cent), the lowest proportion of urban workers being 22 per cent in Sikar district of Rajasthan. In this case the exceptions were the districts of Faridabad in Haryana and Tonk, Jaisalmer, Bhilwara, Chittaurgarh and Kota in Rajasthan. These areas had high proportion of urban workers (above 28 per cent).

(Map 7, Table 6).

## Male-Female Differentials:

According to 1971 census, while 53 per cent of Indian males particpated in work, only 12 per cent of females were included in the workforce. In 1981 the corresponding figures were 52 per cent and 14 per cent respectively. In north-west India, also a disparity was observed in sex compositon of workforce. While the workforce participation rates in 1971 and 1981 among males were 51.4 per cent and 50.6 per cent respectively, they were 6 per cent and 7 per cent respectively among females.

The higher degree of male-female differentials in the proportion of workers is related to a number of historical, social and economic factors. The earning of bread in most societies of the world, even to-day, is primarily the male's responsibility[5]. This

applies with even greater force to developing countries and India is no exception to this. As it is evident from the preceding paragraph that Indian workforce is largely male workforce. Male participation rate in work in India compares favourably with that prevalent in many advanced countries. Since non-participation of women in work and particularly manual work outdoors is every where considered a value[6]. The bulk of the work has to be carried out by males in India. This has a favourable impact upon male participation in work, but the female participation in workforce is adversely affected.

Since earning of family bread in most societies of the world, is primarily the male's responsibility, female participation seldom equals male participation in work. The extent to which the females participate in work in any area depends primarily upon the status which they enjoy in the society, the extent to which they are allowed mobility, the economic exigencies, necessitating their participation in work, the availability of suitable jobs for females and the desire on the part of the females

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6. *Gadgil, D.R. Women in the Working Force in India, Asia Publishing House, 1965, New-York.*

to avail themselves of these opportunities.[7]

## Inter-District Pattern of Workforce Participation Rate Among Males:

Following the same approach, the following main and the sub-categories were formed to analyse the pattern of WPR among males:

A) Areas of high proportion of male workers where they account for more than 52 per cent of male population as main workers, further bifurcated into:

   i. areas having very high proportion of male workers, above 54 per cent and
   ii. areas having high proportion of male workers within the range of 52 to 54 per cent.

B) Areas of low proportion of male workers where they constitute less than 52 per cent of the male population as workers, further bifurcated into:

   i. areas having medium proportion of male workers within the range of 50 per cent

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7. *Chandna R.C.: op.cit. pp.42-62*

to 52 per cent and

ii. areas having low proportion of male workers below 50 per cent.

## Areas of Very High Participation Rate Among Males:

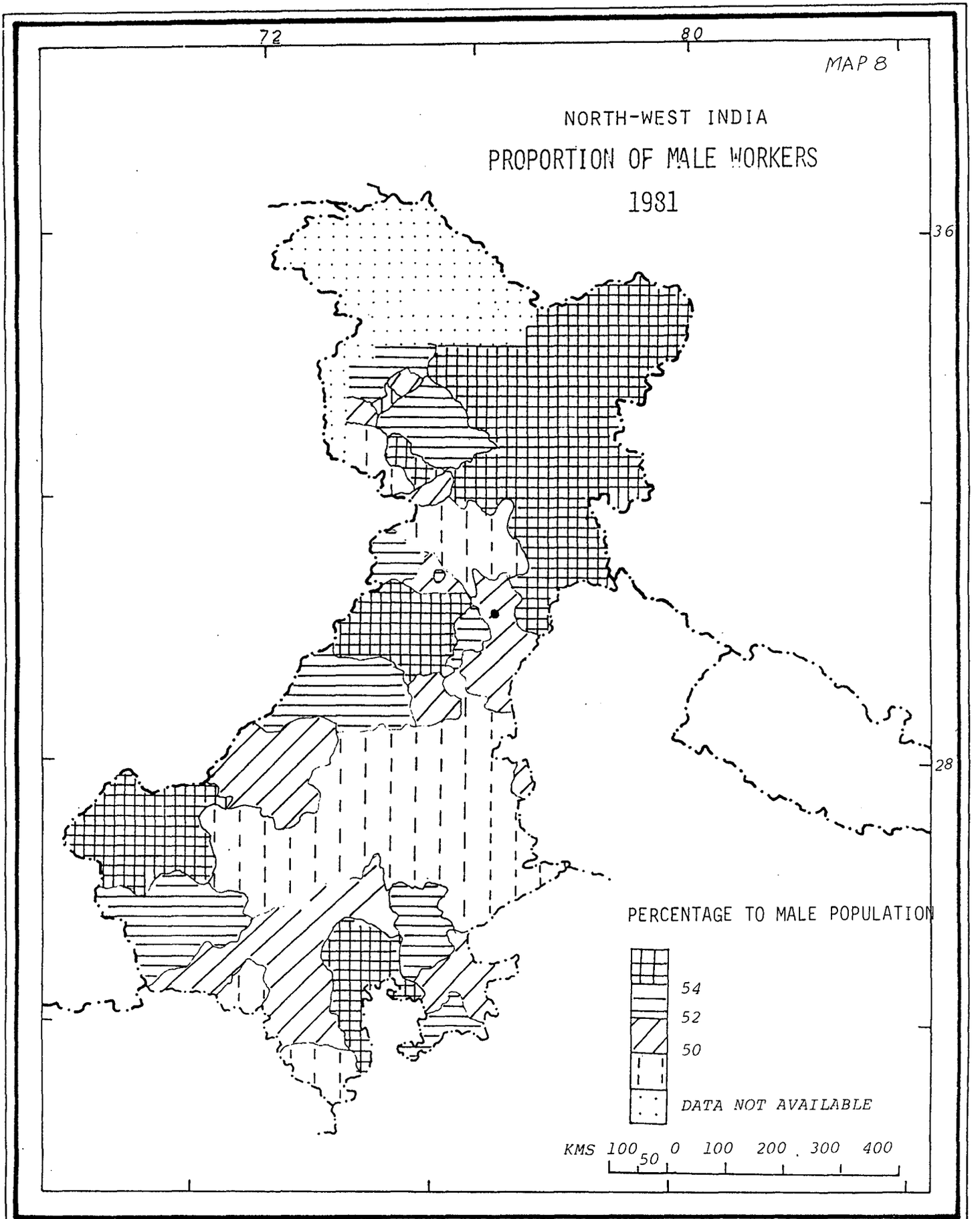
Almost similar to the pattern of TWPR, the eastern districts of Jammu and Kashmir and the northern, eastern and south-eastern districts of Himachal Pradesh forming the single largest contiguous area, had very high proportion of male workers in the region. Another such area was in the southern districts of Punjab, lying to the north-west of Haryana Further, there were two other pockets in western and south-eastern Rajasthan which exhibited a very high proportion of male workers.

(Map 8, Table 7).

## Areas of High Participation Rate Among Males:

The central and north-western districts of Jammu and Kashmir had high proportion of male workers. There were other such scattered pockets in north-western Punjab, northern, south-western and south-eastern Rajasthan and western Haryana.

(Map 8, Table 7).


72
80
MAP 8
NORTH-WEST INDIA
PROPORTION OF MALE WORKERS
1981
36
28
PERCENTAGE TO MALE POPULATION
54
52
50
DATA NOT AVAILABLE
KMS 100 50 0 100 200 300 400

## TABLE - 7

Proportion of Male/Female Workers (in per cent) to Male/Female Population in North-West India,1981.

| Districts | Male | Female |
|---|---|---|
| Anantnag | 53.14 | 7.48 |
| Pulwama | 52.74 | 2.59 |
| Srinagar | 51.83 | 5.24 |
| Badgam | 56.57 | 5.78 |
| Baramula | 53.72 | 5.81 |
| Kupwara | 53.46 | 3.46 |
| Kargil | 55.05 | 33.93 |
| Leh (Ladakh) | 57.12 | 28.22 |
| Doda | 51.29 | 13.76 |
| Udhampur | 55.18 | 5.62 |
| Kathua | 50.61 | 5.05 |
| Jammu | 48.48 | 2.86 |
| Rajauri | 49.80 | 3.07 |
| Punch | 50.31 | 2.30 |
| Chamba | 55.22 | 13.63 |
| Kangra | 44.52 | 9.09 |
| Hamirpur | 37.66 | 13.45 |
| Una | 43.95 | 3.58 |
| Bilaspur | 45.38 | 18.23 |
| Mandi | 48.37 | 26.47 |
| Kullu | 55.98 | 33.22 |
| Lahul and Spiti | 66.05 | 49.99 |

Contd.

| Districts | Male | Female |
|---|---|---|
| Shimla | 56.67 | 34.69 |
| Solan | 51.36 | 16.38 |
| Sirmaur | 58.42 | 19.38 |
| Kinnaur | 61.65 | 46.76 |
| Gurdaspur | 49.09 | 1.73 |
| Amritsar | 53.48 | 2.26 |
| Firozepur | 55.27 | 2.45 |
| Ludhiana | 54.34 | 2.50 |
| Jalandhar | 50.73 | 2.51 |
| Kapurthala | 52.07 | 2.39 |
| Hoshiarpur | 48.41 | 2.30 |
| Rupnagar | 51.33 | 2.68 |
| Patiala | 53.60 | 2.45 |
| Sangrur | 56.91 | 1.90 |
| Bhatinda | -5.74 | 2.03 |
| Faridkot | 54.95 | 2.14 |
| Ambala | 51.90 | 2.76 |
| Kurukshetra | 51.33 | 2.40 |
| Karnal | 50.75 | 3.69 |
| Jind | 49.09 | 6.00 |
| Sonipat | 45.89 | 7.79 |
| Rohtak | 44.28 | 6.79 |
| Faridabad | 50.38 | 3.64 |
| Gurgoan | 48.23 | 4.56 |
| Mahendragarh | 43.34 | 2.41 |
| Bhiwani | 45.78 | 8.40 |

Contd.

| Districts | Male | Female |
|---|---|---|
| Hisar | 51.13 | 5.53 |
| Sirsa | 53.49 | 2.67 |
| Ganganagar | 52.76 | 2.84 |
| Bikaner | 50.18 | 5.89 |
| Churu | 48.36 | 9.70 |
| Jhunjhunun | 42.00 | 7.29 |
| Alwar | 47.72 | 4.31 |
| Bharatpur | 47.68 | 2.72 |
| Swai Madhopur | 48.56 | 6.12 |
| Jaipur | 47.73 | 8.81 |
| Sikar | 43,66 | 4.82 |
| Ajmer | 51.54 | 18.79 |
| Tonk | 52.14 | 14.17 |
| Jaisalmer | 55.03 | 3.79 |
| Jodhpur | 49.51 | 9.78 |
| Nagaur | 49.82 | 15.65 |
| Pali | 50.25 | 12.84 |
| Barmer | 52.92 | 8.53 |
| Jalor | 50.87 | 6.60 |
| Sirohi | 49.50 | 8.62 |
| Bhilwara | 56.99 | 18.86 |
| Udaipur | 51.87 | 7.89 |
| Chittaurgarh | 55.98 | 18.71 |
| Dungarpur | 48.25 | 7.02 |
| Banswara | 49.16 | 6.44 |
| Bundi | 53.55 | 11.81 |
| Kota | 50.01 | 8.31 |

Contd.

| Districts | Male | Female |
|---|---|---|
| Jhalawar | 53.38 | 17.14 |

*SOURCE : As in Table 5.*

## Areas of Medium Participation Rate among Males:

There were some scattered pockets in north-western Jammu and Kashmir, northern, western, and south-eastern Haryana, north-western, south-western and south-eastern Rajasthan etc. which exhibited medium proportion of male workers in the region.

(Map 8, Table 7).

## Areas of Low Participation Rate among Males:

The central and north-eastern Rajasthan alongwith the south-eastern districts of Haryana formed a largest contiguous area of low proportion of male workers. Another such area was in the north-eastern Punjab and south-western Himachal Pradesh. There were some scattered pocket in south-western Jammu and Kashmir and southern Rajasthan which had low proportion of male workers.

(Map 8, Table 7).

## Inter-District Pattern of Workforce Participation Rate Among Females:

To analyse the pattern of workforce participation rate among females, the following main and the sub-categories were formed:

A) Areas of high proportion of female workers where they constitute more than 8 per cent of female population as main workers, further bifurcated into:

   i. areas having high proportion of female workers, above 12 per cent and

   ii. areas having medium proportion of female workers within the range of 8 to 12 per cent

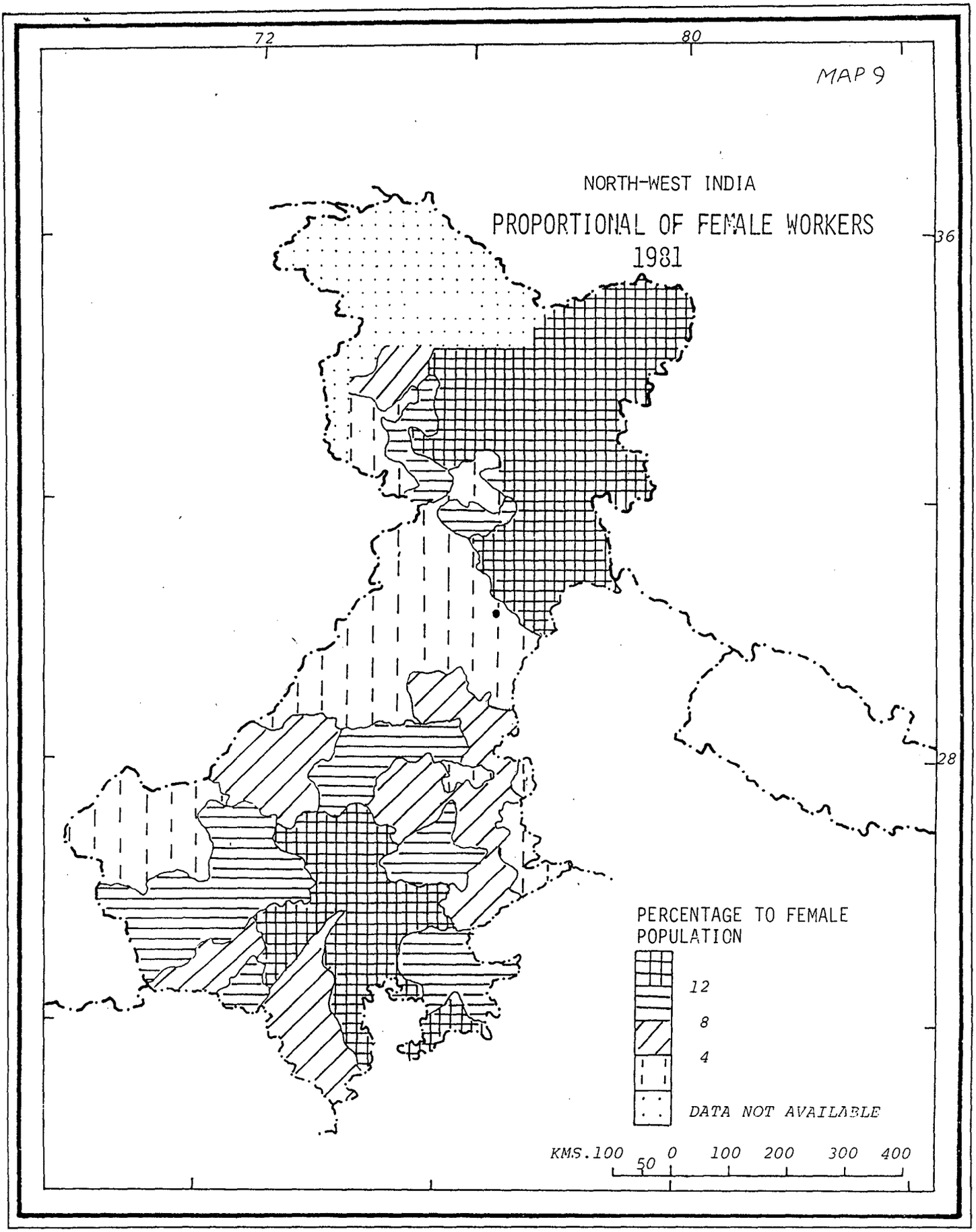
B) Areas of low proportion of female workers where they account for less than 8 per cent of the female population as workers, further bifurcated into:

   a. areas of low proportion of female workers within the range of 4 to 8 per cent and

   b. areas of very low proportion of female workers below 4 per cent.

## Areas of High Participation Rate among Females:

The north-eastern part of the region comprising eastern Jammu and Kashmir and northern, central, eastern and south-eastern Himachal Pradesh formed the largest contiguous area of high proportion of female workers. Another such area was in the central and south-eastern Rajasthan.


72
80
MAP 9
NORTH-WEST INDIA
PROPORTIONAL OF FEMALE WORKERS
1981
36
28
PERCENTAGE TO FEMALE POPULATION
12
8
4
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

## Areas of Medium Participation Rate among Females:

There were some scattered pockets viz. southern and central Jammu and Kashmir, western Himachal Pradesh, south-western, south-eastern, north-eastern and northern Rajasthan, which exhibited medium proportion of female workers.

## Areas of Low Participation Rate among Females:

The north-western Jammu and Kashmir, central and eastern Haryana, north-eastern, south-western and north-western Rajasthan were the areas having low proportion of female workers.

## Areas of Very Low Participation Rate among Females:

The northern Haryana, whole Punjab and few districts in Rajasthan and Himachal Pradesh formed the largest contiguous area of very low proportion of female workers. Further, there were some pockets in western, north-eastern Rajasthan and western Jammu and Kashmir which exhibited very low WPR among females.

When the map number 3,8, and 9 showing TWPR, MWPR and FWPR are compared, it becomes obvious that the north-eastern districts of the region (north-west India) show high proportion of workers in all

the three above mentioned cases. However, the high TWPR in central and southern Punjab owed its existence to high incidence of male workers in the area. The female workforce participation rate in this above mentioned region of Punjab is very low. But the high incidence of TWPR in southern Rajasthan is mainly due to high incidence of FWPR in the area.

## Degree of Variability in Workforce Participation Rates:

In the preceding sections the aggregate workforce participation rate and workforce participation rates among males and females were discussed. For example, in Jammu and Kashmir, in 1971 census,the difference between the highest TWPR (Ladakh, 43.7 per cent) and the lowest TWPR (Jammu, 24.4 per cent) was 19.3 per cent points. In 1981, the difference in TWPR decreased marginally and it was 18.7 per cent points (Highest; Kargil, 45.3 per cent and Lowest; Jammu, 26.6 per cent). In Himachal Pradesh, the difference between highest and lowest TWPR in 1971 worked out to be 37.2 per cent points (Highest; Lahul and Spiti, 64.7 per cent and Lowest; Kangra, 27.4 per cent). It decreased to 35.5 per cent points in 1981 (Highest; Lahul and Spiti, 59 per cent and lowest; Una, 23.4 per cent). The corresponding figures in 1971 and 1981 were 5.1 per cent points and 5 per cent points for Punjab, 4.5 per cent points and 6.3 per

## TABLE - 8

Degree of Variability in Workforce Participation Rate among Districts of the States in North-West India, 1971 and 1981.

| STATES | YEAR | SD/CV | TOTAL WPR | TOTAL MWPR | TOTAL FWPR |
|---|---|---|---|---|---|
| JAMMU & KASHMIR | 1971 | SD | 5.27 | 3.51 | 8.50 |
| | | CV | 17.07 | 6.63 | 139.11 |
| | 1981 | SD | 5.79 | 2.49 | 9.63 |
| | | CV | 17.72 | 4.71 | 107.71 |
| HIMACHAL PRADESH | 1971 | SD | 10.57 | 6.74 | 16.23 |
| | | CV | 23.64 | 11.72 | 52.90 |
| | 1981 | SD | 10.88 | 7.97 | 13.97 |
| | | CV | 28.43 | 15.31 | 58.84 |
| PUNJAB | 1971 | SD | 1.62 | 2.89 | 0.21 |
| | | CV | 5.65 | 5.45 | 18.26 |
| | 1981 | SD | 1.58 | 2.57 | 0.27 |
| | | CV | 5.40 | 4.85 | 11.84 |
| HARYANA | 1971 | SD | 1.35 | 2.46 | 0.78 |
| | | CV | 5.11 | 5.22 | 30.95 |
| | 1981 | SD | 1.66 | 3.13 | 2.05 |
| | | CV | 5.87 | 6.42 | 43.43 |
| RAJASTHAN | 1971 | SD | 3.22 | 3.38 | 3.92 |
| | | CV | 10.28 | 6.46 | 47.57 |
| | 1981 | SD | 3.55 | 3.36 | 4.90 |
| | | CV | 11.53 | 6.68 | 51.63 |

Where: SD = Standard Deviation
CV = Coefficient of Variation.

*SOURCE : Computed from Table 3.*

cent points for Haryana and 14 per cent points and 13.8 per cent points for Rajasthan respectively. (Calculated from Table 3).

The above figures though gave on over-all idea about the differences in TWPR that exist among districts of various states, but were not enough to explain as to how much the degree of variation was there in a particular state and were not sufficient to get a comparative picture. The study of variation in TWPR in a particular state was important as in some other it was very low. Since the percentages are not enough to show the degree of variation that might exist in a particular state, the statistical methods of standard deviation and coefficient of variation were computed and discussed below.

By working out the standard deviation and coefficient of variation it was found that the degree of variability in TWPR among districts was very low in Punjab and Haryana. It was medium in Rajasthan and Jammu and Kashmir. The variability TWPR was observed highest in case of Himachal Pradesh in both the years viz. 1971 and 1981. As for the variability in MWPR among various districts of the state, it was

higher than the degree of variation in FWPR, except Haryana and Punjab. Further, the variability in 1971 in MWPR among various districts of the states was highest in Himachal Pradesh followed by Jammu and Kashmir, Rajasthan, Punjab and Haryana. In 1981 it was highest in Himachal Pradesh followed by Rajasthan, Haryana, Punjab and Jammu and Kashmir. As for the degree of variability reflected through coefficient of variation in FWPR was highest in Jammu and Kashmir followed by Himachal Pradesh, Rajasthan, Haryana and Punjab.

( Table 8 )

The cause of such variation in TWPR is due to the fact that the effect of various factors of TWPR is not same in the areas and further the spatial distribution of explanatory variables of TWPR is not similar. An attempt has been made in the chapter that follows the next one to correlate high or low TWPR to certain explanatory variables.

■■■■■■■■

# CHAPTER - IV

## SECTORAL DISTRIBUTION OF WORKFORCE AND SECTORAL - SHIFT, 1971-81

Economic growth is identified with a continuous and sustained rise in the real income per capita. Such a rise in income per capita is accompanied by fundamental changes in the organisation, structure and functioning of the economy. One of the fundamental transformations accompanying the development process is the changing industrial distribution of the labour force and product with shift from agricultural to non-agricultural activities[1]. Several economists in the past such as Petty, Adam Smith, Marx and others laid emphasis on the changing distribution of the industrial labour force. Clark and Kuznets are the most prominent among those who analysed the changing sectoral distribution of workforce in the context of economic growth in recent times. According to their studies, the history of all developed countries shows that sectoral shifts in occupation follows a definite pattern. This pattern has been one of labour moving from less produc-

1. *U.N. Determinants and Consequences of Population Trends, Vol. 1 P.506.*

tive occupations to more productive occupations. Since the secondary and tertiary sectors are definitely more productive in terms of value added per worker, the share of agriculture in total work-force declines, while that of the secondary and tertiary sectors increases. Economic growth, which is the result of increased productivity and technological progress, releases certain forces of demand and supply which inturn bring about these structural changes. As income start rising there is a shift away from demand for primary products and the demand for manufactured goods and services increases. This, of course, is the result of the low income elasticity of demand for primary products. The increasing productivity in the non-agricultural activities and the fall in the demand for agricultural products result in the outflow of resources used in production from the primary to the secondary and tertiary sector. Thus there is an increasing migration of labour to more productive activities. The rising level of technology aids this process by intensifying the shift of labour by constantly raising productivity and making it possible to create new products and the resulting demand for them[2].

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2. *Kuznets, Simon: 'Economic Growth and Structure" 1966,p.202*

As more and more resources, particularly labour, shift in favour of non-agricultural activities, this manifests itself in changes in the sectoral shares of the national product. But the structural change is most evident in the distribution of the labour force. In countries where per capita income grew significantly, the proportion of the labour force engaged in agriculture declined and that in non-agricultural industries increased[3].

It can be easily seen from the above discussion that the pattern in which a country's labour force is distributed among the various sectors may be taken as an index of economic development. And in the above context the pattern of sectoral distribution of workforce in north-west India has been analysed. Further, in the next section, the sectoral shift over the decade 1971-81, as reflected through shift in the labour force from agricultural to non-agricultural activities, has been brought out in the context of the massive investment in both agricultural and non-agricultural sectors thereby causing a shift in the distribution of workforce. Although classifying the active population into three sectors is sometime unsatisfactory, as it does reflect

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3. *Kuznets, Simon: Economic Growth and Structure, 1966, p.24*

fairly accurately changes in the workforce resulting in the process of development.

## Patterns of Sectoral Distribution of Workforce:

## Regional Analysis:

The agrarian nature of economy is a marked feature in India, as majority of workforce is engaged in the primary sector, whereas the proportion of workers in the other two sectors viz. secondary and tertiary, is quite small. The same characteristic of sectoral distribution of workforce is exhibited in north-west India. At the regional level, in 1971, 72 per cent of main workers were engaged in primary sector, while their proportion in secondary and tertiary sectors was 8.4 per cent and 19.5 per cent respectively. However, in 1981, the share of primary and tertiary sectors decreased to 70 per cent and 16 per cent respectively, while that of secondary sector increased to 13 per cent (Table 9).

Another characteristic of sectoral distribution of workforce was that while primary sector was mainly the rural sector, the secondary and tertiary sectors were, by and large, urban sectors of the economy. It

# TABLE - 9

Sectoral Distribution (in per cent) of Workforce in North-West India and States, 1971.

| REGION/STATE | | Primary Sector | | | Secondary Sector | | | Tertiary Sector | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | P | M | F | P | M | F | P | M | F |
| N.W.India | T | 72.12 | 70.82 | 84.46 | 8.39 | 8.70 | 5.45 | 19.49 | 20.48 | 10.09 |
| | R | 83.89 | 82.97 | 91.93 | 6.26 | 6.52 | 3.93 | 9.85 | 10.51 | 4.14 |
| | U | 12.68 | 12.45 | 16.44 | 19.15 | 19.14 | 19.32 | 68.17 | 68.41 | 64.24 |
| Jammu and Kashmir | T | 71.63 | 71.75 | 79.45 | 9.04 | 0.07 | 8.38 | 19.33 | 19.78 | 12.17 |
| | R | 83.04 | 82.70 | 88.12 | 5.80 | 5.64 | 8.08 | 11.16 | 11.66 | 3.80 |
| | U | 14.11 | 14.11 | 14.33 | 25.36 | 26.02 | 10.57 | 60.53 | 59.87 | 75.10 |
| Himachal Pradesh | T | 77.61 | 71.17 | 94.57 | 8.18 | 10.54 | 1.97 | 14.21 | 18.29 | 3.46 |
| | R | 82.35 | 76.71 | 96.27 | 6.80 | 8.84 | 1.78 | 10.85 | 14.45 | 1.95 |
| | U | 9.16 | 8.67 | 14.29 | 28.05 | 29.72 | 10.78 | 62.79 | 61.61 | 74.93 |
| Punjab | T | 63.64 | 64.53 | 17.19 | 13.27 | 1320 | 17.22 | 23.09 | 22.27 | 65.59 |
| | R | 79.51 | 80.04 | 34.08 | 8.22 | 8.05 | 22.72 | 12.27 | 11.91 | 43.20 |
| | U | 11.11 | 11.10 | 2.42 | 29.98 | 30.92 | 12.42 | 58.91 | 57.98 | 85.16 |
| Haryana | T | 66.83 | 66.92 | 64.87 | 11.80 | 11.77 | 12.33 | 21.37 | 21.31 | 22.80 |
| | R | 78.68 | 78.66 | 79.32 | 8.39 | 14.11 | 11.35 | 12.93 | 7.23 | 9.33 |
| | U | 11.27 | 11.18 | 12.86 | 27.76 | 28.42 | 15.87 | 60.97 | 60.40 | 71.27 |
| Rajasthan | T | 77.24 | 75.61 | 88.42 | 7.87 | 8.31 | 4.81 | 14.89 | 16.08 | 6.77 |
| | R | 87.89 | 86.93 | 93.96 | 4.70 | 4.97 | 3.01 | 7.41 | 8.10 | 3.03 |
| | U | 14.90 | 14.16 | 24.74 | 26.40 | 26.47 | 25.49 | 58.70 | 59.37 | 49.77 |

SOURCE : General Economic Tables for the States, Part II-B 1971 and Part III A and B 1981.

would, however, be wrong to say that primary sector was missing in urban areas and there was no share of secondary and tertiary sectors in rural areas. In 1981, 81 per cent of workers in rural areas and 14 per cent in urban areas were engaged in the primary sector. The proportion of workers in secondary and tertiary sectors in urban areas was 32 per cent and 54 per cent respectively. However, in rural areas it was 8 per cent in secondary sector and 11 per cent in tertiary sector of the economy. (Table 9 A).

## Inter-District Pattern of Sectoral Distribution of Workforce:

To analyse the pattern of sectoral distribution of workforce among districts, the approach followed in this section was similar to that adopted while analysing the pattern of workforce participation rates in the previous chapter. The procedure followed was that the data were arranged in a descending order, and the quartile values were coverted into round figures formulating two main categories and two sub-categories therein.

Table 9 (A)

Sectoral Distribution (in per cent) of workforce in North-West India and States, 1981.

| Region/State | | Primary Sector | | | Secondary Sector | | | Tertiary Sector | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | P | M | F | P | M | F | P | M | F |
| N.W. India | T | 70.32 | 65.51 | 80.89 | 13.42 | 13.55 | 7.29 | 16.26 | 20.94 | 11.82 |
| | R | 80.96 | 79.89 | 88.39 | 8.02 | 8.43 | 5.17 | 11.02 | 11.68 | 6.44 |
| | U | 14.16 | 12.98 | 29.63 | 31.50 | 32.25 | 21.76 | 54.34 | 54.77 | 48.61 |
| Jammu and Kashmir | T | 64.07 | 63.61 | 68.66 | 14.07 | 13.82 | 16.50 | 21.86 | 22.57 | 14.84 |
| | R | 76.51 | 76.57 | 80.84 | 10.16 | 9.32 | 13.41 | 13.33 | 14.11 | 5.75 |
| | U | 14.40 | 14.51 | 13.34 | 29.67 | 29.59 | 30.51 | 55.93 | 55.90 | 56.15 |
| Himachal Pradesh | T | 73.60 | 66.77 | 92.17 | 10.70 | 13.60 | 2.82 | 15.70 | 19.63 | 5.01 |
| | R | 78.76 | 72.46 | 94.96 | 9.54 | 12.32 | 2.39 | 11.70 | 15.22 | 2.65 |
| | U | 10.42 | 9.68 | 15.61 | 24.97 | 26.45 | 14.57 | 69.61 | 63.87 | 69.82 |
| Punjab | T | 59.05 | 60.05 | 32.27 | 15.17 | 15.22 | 14.07 | 25.78 | 24.73 | 53.66 |
| | R | 76.17 | 77.88 | 53.59 | 8.80 | 8.59 | 16.02 | 15.03 | 13.53 | 30.39 |
| | U | 11.95 | 12.37 | 6.12 | 31.71 | 32.95 | 11.69 | 56.34 | 54.68 | 82.19 |

| Region/State | | Primary Sector | | | Secondary Sector | | | Tertiary Sector | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | P | M | F | P | M | F | P | M | F |
| Haryana | T | 61.80 | 60.96 | 71.84 | 15.41 | 15.99 | 8.51 | 22.79 | 23.05 | 19.65 |
| | R | 76.48 | 75.67 | 85.69 | 9.85 | 10.14 | 6.52 | 13.67 | 14.19 | 7.79 |
| | U | 10.59 | 10.62 | 10.24 | 34.82 | 36.02 | 17.35 | 54.59 | 53.36 | 72.41 |
| Rajasthan | T | 73.51 | 70.34 | 86.64 | 10.90 | 11.67 | 6.43 | 15.59 | 17.99 | 6.93 |
| | R | 85.63 | 84.19 | 93.15 | 6.47 | 6.92 | 4.13 | 7.90 | 8.89 | 2.72 |
| | U | 15.23 | 14.25 | 26.78 | 30.65 | 30.91 | 27.57 | 54.12 | 54.84 | 45.65 |

Source: General Economic Tables Part II-B.

## Pattern of Workforce Participation Rate in Primary Sector:

To analyse the pattern of WPR in primary sector the following categories were formed:

A) Areas having high proportion of workers where they account for more than 70 per cent of main workers in primary sector. They were further bifurcated into:

   i. areas having very high proportion of workers in primary sector i.e. above 78.00 per cent and

   ii. areas having high proportion of workers in primary sector in the range of 70.00 per cent to 78.00 per cent.

B) Areas of low proportion of workers where they constitute less than 70 per cent of main workers in primary sector, further bifurcated into:

   i. areas of medium proportion of workers in primary sector in the range of 62.00 per cent to 70.00 per cent and

   ii. areas having low proportion of workers in primary sector below 62.00 per cent.

## Areas having Very High Participation Rate in Primary Sector:

The western and central districts of Jammu and Kashmir formed scattered pockets of areas having very high WPR in primary sector. Such scattered areas were exhibited in central and southern parts of Himachal Pradesh. Further, some districts in south-east Rajasthan alongwith few scattered pockets also had very high WPR in primary sector.

(Map 10, Table 10).

## Areas having High Participation Rate in Primary Sector:

A number of districts in the region had high WPR in primary sector in the range of 70.00 per cent to 78.00 per cent. The northern and north-eastern districts of Rajasthan formed a largest contiguous area of high WPR in primary sector. Further, the districts in the central parts of Punjab-Haryana plain also had high WPR in primary sector. There were other such scattered pockets in southern Rajasthan, central and eastern Jammu and Kashmir and southern Himachal Pradesh.

(Map 10, Table 10).

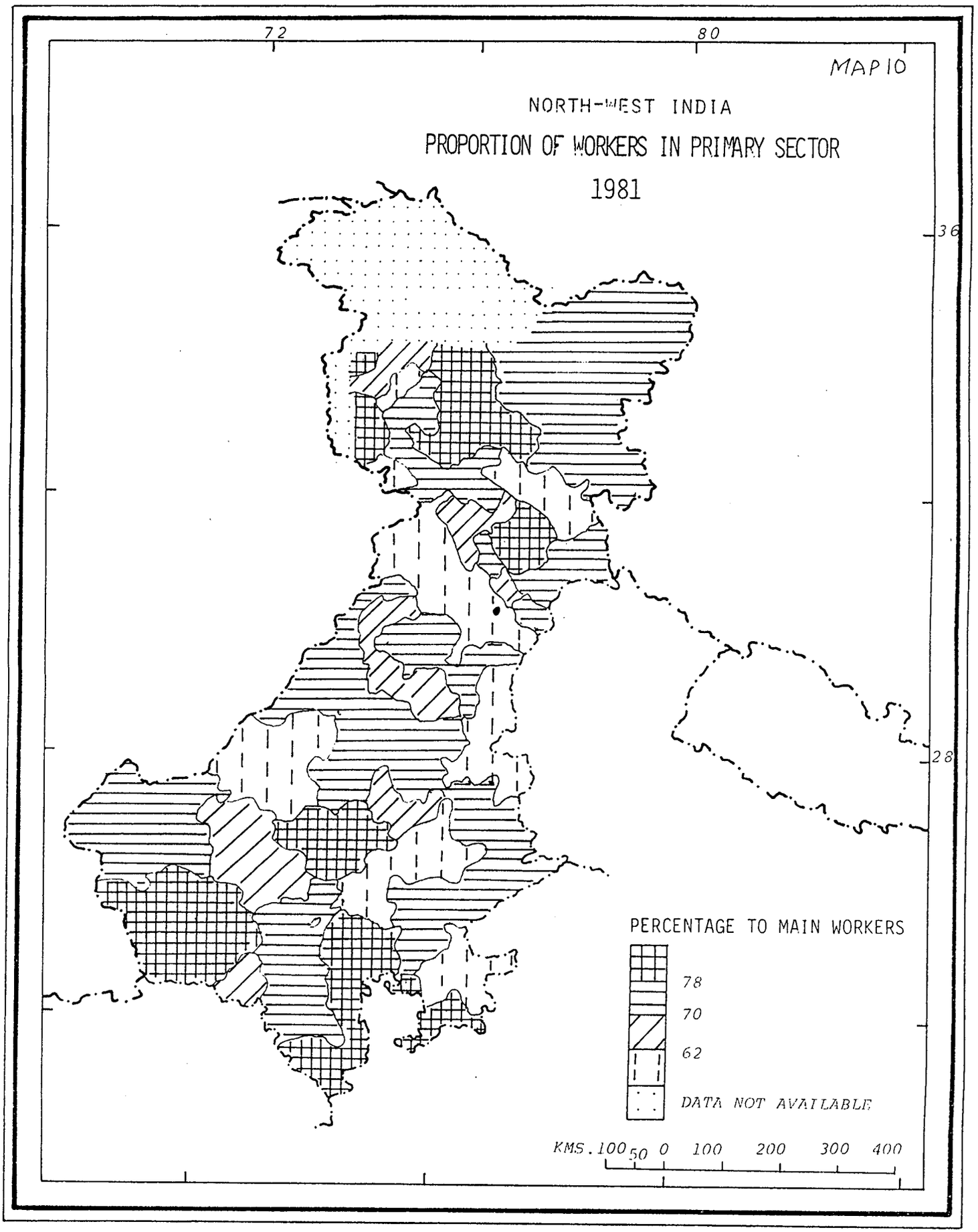

72
80
MAP 10
NORTH-WEST INDIA
PROPORTION OF WORKERS IN PRIMARY SECTOR
1981
36
28
PERCENTAGE TO MAIN WORKERS
78
70
62
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

Table-10

Sectoral Distribution (in per cent) of Workforce in Districts of North-West India, 1981.

| Districts | Primary | | Secondary | | Testing | |
|---|---|---|---|---|---|---|
| | T | R | T | U | T | U |
| Anantnag | 71.71 | 77.09 | 11.82 | 26.03 | 16.47 | 50.80 |
| Pulwama | 70.82 | 74.66 | 13.73 | 27.37 | 15.45 | 41.27 |
| Srinagar | 23.40 | 70.74 | 33.23 | 37.77 | 43.37 | 51.81 |
| Badgam | 60.54 | 65.80 | 24.20 | 28.05 | 15.26 | 49.15 |
| Baramula | 64.91 | 70.73 | 16.43 | 24.47 | 18.66 | 51.50 |
| Kupwara | 81.37 | 82.97 | 6.26 | 14.95 | 11.87 | 40.22 |
| Kargil | 78.47 | 81.18 | 3.34 | 15.90 | 18.19 | 58.33 |
| Leh(Ladakh) | 70.70 | 78.31 | 4.18 | 12.68 | 25.12 | 66.31 |
| Doda | 85.26 | 88.91 | 4.74 | 18.75 | 10.00 | 63.60 |
| Udhampur | 75.00 | 81.59 | 8.56 | 20.77 | 16.44 | 72.48 |
| Kathura | 70.02 | 75.61 | 11.32 | 23.34 | 18.66 | 51.67 |
| Jammu | 50.05 | 67.40 | 13.84 | 22.11 | 36.12 | 67.45 |
| Rajauri | 81.95 | 85.79 | 4.04 | 14.76 | 14.01 | 65.26 |
| Punch | 79.33 | 82.71 | 4.50 | 14.49 | 16.17 | 61.21 |
| Chamba | 73.44 | 77.71 | 14.72 | 22.91 | 11.84 | 68.86 |
| Kangra | 65.17 | 68.05 | 13.60 | 20.33 | 21.23 | 62.98 |
| Hamirpur | 72.19 | 75.83 | 10.31 | 21.07 | 17.50 | 60.72 |
| Una | 68.74 | 72.61 | 13.10 | 25.56 | 18.16 | 46.67 |
| Bilaspur | 77.79 | 80.81 | 9.19 | 20.28 | 13.02 | 60.57 |
| Mandi | 79.54 | 84.22 | 9.21 | 40.75 | 11.25 | 49.92 |
| Kullu | 84.97 | 89.60 | 5.07 | 25.50 | 9.96 | 63.37 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Lahul & Spiti | 54.25 | 54.25 | 31.12 | - | 14.63 | - |
| Shimla | 73.77 | 84.73 | 6.82 | 17.11 | 19.41 | 77.71 |
| Solan | 69.94 | 78.23 | 12.69 | 34.69 | 17.37 | 60.49 |
| Sirmaur | 78.14 | 82.87 | 10.75 | 27.70 | 11.11 | 63.41 |
| Kinnaur | 71.03 | 71.03 | 11.08 | 11.08 | 17.89 | - |
| Gurdaspur | 57.06 | 70.63 | 14.40 | 28.39 | 28.54 | 62.95 |
| Amritsar | 54.56 | 76.94 | 15.63 | 31.70 | 29.81 | 59.30 |
| Firozepur | 70.15 | 85.90 | 9.47 | 27.22 | 20.38 | 60.40 |
| Ludhiana | 45.02 | 73.28 | 25.94 | 45.84 | 29.04 | 45.90 |
| Jalandhar | 47.60 | 70.41 | 21.35 | 32.80 | 31.05 | 59.26 |
| Kapurthala | 54.79 | 73.58 | 19.97 | 35.89 | 25.24 | 51.17 |
| Hoshiarpur | 58.34 | 66.34 | 13.68 | 22.14 | 27.98 | 63.22 |
| Rupnagar | 52.82 | 65.53 | 17.61 | 31.67 | 29.57 | 59.17 |
| Patiala | 58.57 | 77.38 | 14.17 | 27.07 | 27.26 | 60.76 |
| Sangrur | 72.05 | 84.21 | 9.99 | 24.65 | 17.96 | 48.65 |
| Bhatinda | 70.33 | 85.78 | 9.68 | 22.50 | 19.99 | 61.01 |
| Faridkot | 69.37 | 85.28 | 9.83 | 23.20 | 20.30 | 59.23 |
| Ambala | 46.01 | 66.44 | 23.78 | 38.13 | 30.21 | 57.67 |
| Kurukshetra | 70.07 | 80.84 | 10.18 | 17.70 | 19.75 | 77.81 |
| Karnal | 59.98 | 77.76 | 15.25 | 35.41 | 24.77 | 52.85 |
| Jind | 75.44 | 83.25 | 8.63 | 22.98 | 15.93 | 54.74 |
| Sonipat | 60.20 | 71.08 | 16.01 | 33.29 | 23.79 | 57.23 |
| Rohtak | 59.64 | 71.40 | 14.01 | 25.55 | 26.35 | 63.08 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Faridabad | 42.74 | 71.99 | 32.41 | 54.65 | 24.85 | 38.26 |
| Gurgaon | 60.14 | 71.58 | 13.72 | 26.22 | 26.14 | 61.47 |
| Mahendragarh | 61.03 | 69.39 | 14.31 | 25.64 | 24.66 | 62.45 |
| Bhiwani | 71.17 | 82.18 | 11.23 | 38.52 | 17.60 | 48.65 |
| Hisar | 69.93 | 82.75 | 11.78 | 11.37 | 18.29 | 83.02 |
| Sirsa | 71.29 | 86.11 | 10.00 | 26.76 | 18.71 | 60.66 |
| Ganganagar | 73.83 | 87.76 | 9.14 | 26.14 | 17.03 | 55.96 |
| Bikaner | 59.30 | 85.22 | 12.76 | 23.52 | 27.94 | 66.50 |
| Churu | 77.78 | 93.15 | 7.66 | 25.54 | 14.56 | 46.99 |
| Jhunjhunun | 70.30 | 80.73 | 12.47 | 34.12 | 17.23 | 40.67 |
| Alwar | 74.06 | 81.82 | 9.53 | 28.21 | 16.41 | 61.36 |
| Bharatpur | 76.38 | 86.64 | 8.53 | 28.10 | 15.09 | 50.08 |
| SwaiMadhopur | 77.14 | 84.91 | 8.61 | 27.14 | 14.25 | 54.57 |
| Jaipur | 55.58 | 79.57 | 18.31 | 34.12 | 26.11 | 57.56 |
| Sikar | 67.97 | 79.64 | 13.87 | 37.48 | 18.16 | 48.06 |
| Ajmer | 61.11 | 86.51 | 15.62 | 33.41 | 23.27 | 56.84 |
| Tonk | 76.66 | 86.81 | 10.89 | 35.74 | 12.45 | 43.32 |
| Jaisalmer | 75.07 | 84.32 | 8.30 | 18.99 | 16.63 | 68.94 |
| Jodhpur | 66.80 | 90.06 | 11.51 | 28.90 | 21.69 | 58.74 |
| Nagaur | 80.37 | 87.88 | 8.88 | 35.94 | 10.35 | 39.47 |
| Pali | 72.67 | 81.42 | 13.68 | 34.59 | 13.65 | 38.67 |
| Barmer | 85.67 | 91.24 | 5.88 | 34.79 | 8.45 | 48.90 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7. |
|---|---|---|---|---|---|---|
| Jaler | 83.67 | 87.87 | 6.70 | 23.17 | 9.63 | 48.24 |
| Sirohi | 67.33 | 78.42 | 11.84 | 21.51 | 20.83 | 67.21 |
| Bhilwara | 81.69 | 88.10 | 8.23 | 29.91 | 10.08 | 41.90 |
| Udaipur | 74.75 | 84.65 | 9.56 | 26.72 | 15.69 | 60.10 |
| Chittaurgarh | 80.77 | 87.58 | 8.29 | 26.21 | 10.94 | 54.75 |
| Dungarpur | 84.17 | 88.35 | 5.31 | 21.80 | 10.52 | 64.48 |
| Banswara | 82.60 | 87.55 | 7.75 | 31.58 | 9.65 | 61.03 |
| Bundi | 77.59 | 86.31 | 9.98 | 30.60 | 12.43 | 49.70 |
| Kota | 61.26 | 82.49 | 16.15 | 34.71 | 22.59 | 54.83 |
| Thalawar | 83.43 | 89.18 | 7.04 | 24.63 | 9.53 | 53.28 |

Source: General Economic Tables Part-III A & B.

## Areas having Medium Participation Rate in Primary Sector:

Some scattered pockets in northern Jammu and Kashmir, western Himachal Pradesh, western Haryana and Punjab and Central Rajasthan exhibited medium proportion of workers in primary sector.

(Map 10, Table 10).

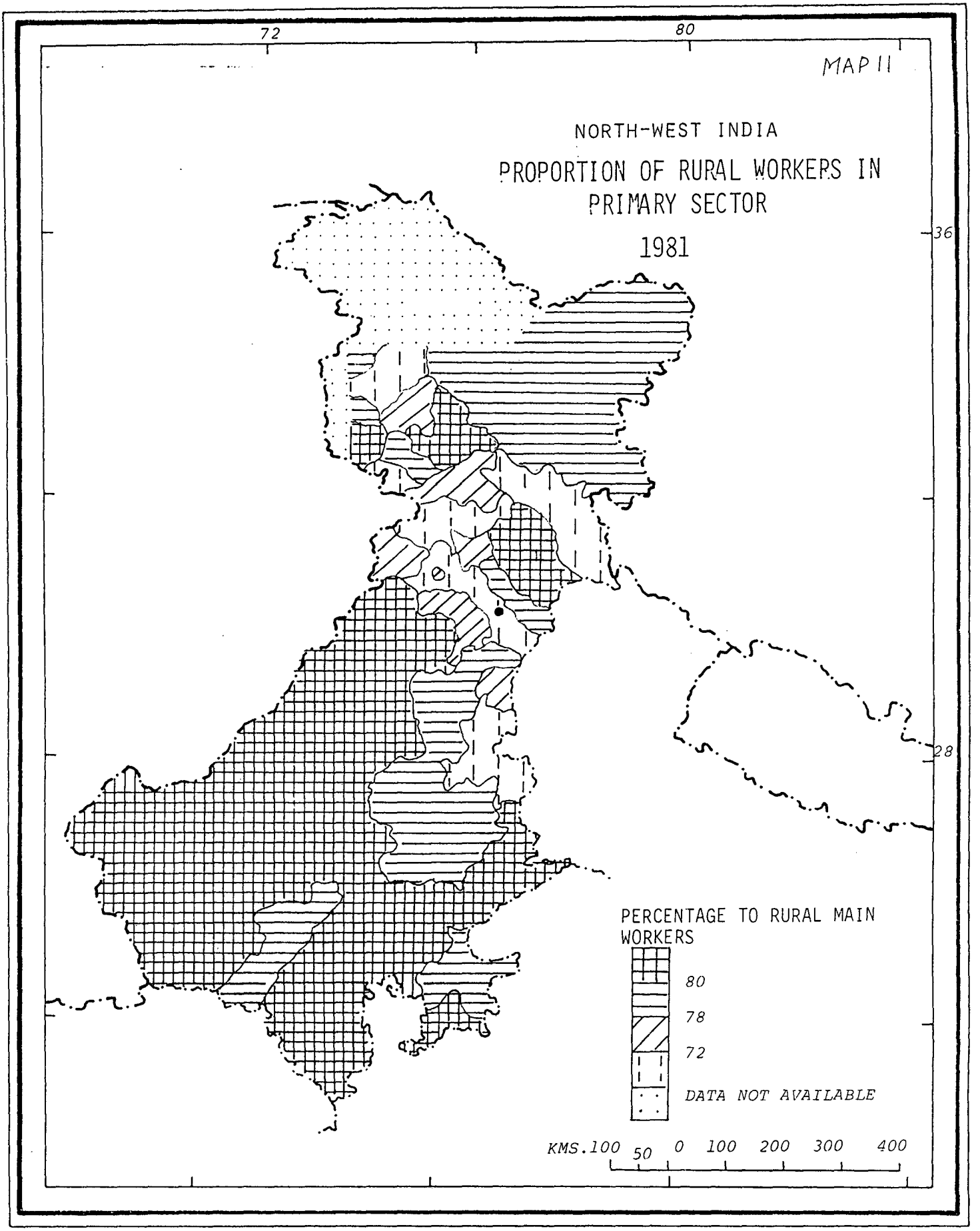
## Areas having Low Participation Rate in Primary Sector:

The northern districts of Punjab and Haryana formed a single largest contiguous area of low WPR in primary sector. Another area in Haryana, along union territory of Delhi, exhibited low WPR in primary sector. Further, there were some scattered pockets in Jammu and Kashmir, Himachal Pradesh and Rajasthan showing low proportion of workers in primary sector.

(Map 10, Table 10).

## Pattern of Workforce Participation in Primary Sector in Rural Areas:

As stated earlier, primary sector is mainly the rural sector of the economy and a more clear pattern of the same emerges as shown in map 11.


72
80
MAP II
NORTH-WEST INDIA
PROPORTION OF RURAL WORKERS IN PRIMARY SECTOR
1981
36
28
PERCENTAGE TO RURAL MAIN WORKERS
80
78
72
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

Areas of Very High WPR in Rural Primary Sector (above 84.00 per cent):

A number of districts in Rajasthan and south-western Punjab-Haryana plain formed a single largest contiguous area of very high WPR in primary sector. Further, there were some scattered pockets in Jammu and Kashmir and Himachal Pradesh having very high proportion of workers in primary sector.

(Map 11, Table 10).

Areas of High WPR in Secondary Sector in Rural Areas (78.00 per cent to 84.00 per cent):

The north-eastern Rajasthan alongwith some districts of Haryana formed a contiguous area of high proportion of workers in primary sector in rural areas. Besides, some scattered pockets in Rajasthan and Himachal Pradesh, the eastern Jammu and Kashmir also had high WPR in primary sector in rural areas.

(Map 11, Table 10).

Areas of Medium WPR in Rural Primary Sector (72.00 per cent to 78 per cent):

The central districts of Punjab-Haryana plain and Himachal Pradesh alongwith central Jammu and Kashmir constituted scattered pockets exhibiting

medium proportion of workers in primary sector in rural areas.

(Map 11, Table 10).

### Areas of Low WPR in Rural Primary Sector (Below 72.00 per cent):

The districts bordering the union territory of Delhi in Haryana exhibited low WPR in primary sector in rural areas. Further, some areas in northern Punjab-Haryana plain, north-east Himachal Pradesh and north-west Jammu and Kashmir also had low WPR in primary sector in rural areas.

(Map 11, Table 10).

### Pattern of Workforce Participation Rate in Secondary Sector:

### Areas of High WPR in Secondary Sector (above 14 per cent)

The northern districts of Punjab-Haryana plain and Himachal Pradesh formed a contiguous belt of high WPR in secondary sector. The districts in Haryana bordering the union territory of Delhi also had high WPR in secondary sector. Further, there were some pockets in eastern Rajasthan and north-western Jammu and Kashmir which had high proportion of workers in secondary sector.

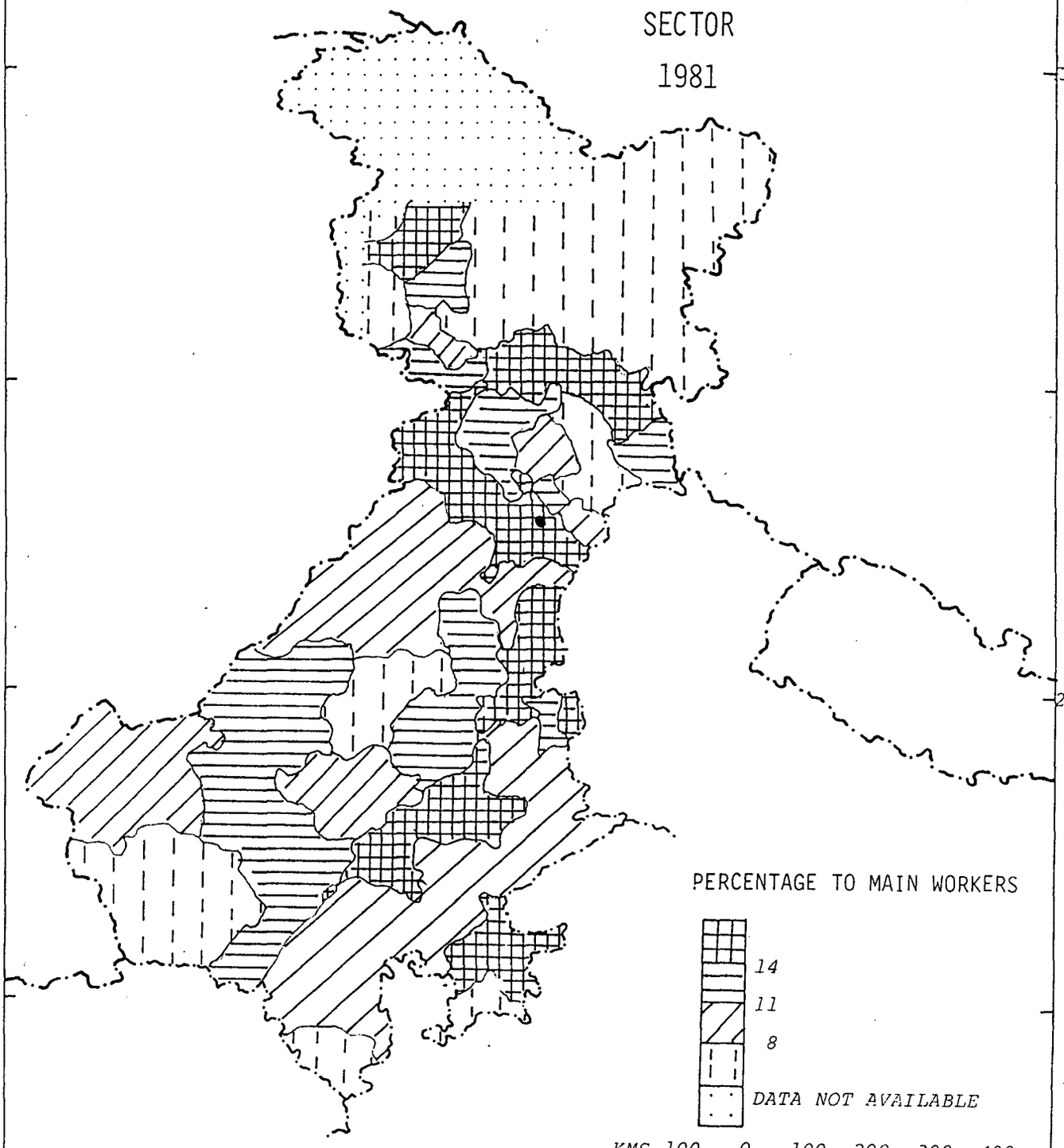
(Map 12, Table 10).

MAP 12

NORTH-WEST INDIA

# PROPORTION OF WORKERS IN SECONDARY SECTOR

1981



## Areas of Medium WPR in Secondary Sector (11 per cent to 14 per cent):

Some districts in western and northern Rajasthan, Haryana and Himachal Pradesh had medium proportion of workers in secondary sector. Few scattered pockets in central Jammu and Kashmir also exhibited medium proportion of workers in secondary sector.

(Map 12, Table 10).

## Areas of Low WPR in Secondary Sector (8 per cent to 11 per cent ):

Most of the districts in the region had low WPR in secondary sector. In Rajasthan, the districts lying to the east of Aravali range had low proportion of workers in secondary sector. Further, the northern district of Rajasthan, and south-western districts of Punjab together with some districts of Haryana formed a contiguous area having low WPR in secondary sector. Besides these, there were some scattered pockets in Himachal Pradesh and Jammu and Kashmir having low proportion of workers in secondary sector.

(Map 12, Table 10).

## Areas of Very Low WPR in Secondary Sector (Below 8 per cent):

The districts lying to the east of Anatnag in Jammu and Kashmir and the western districts of the state had very low WPR in secondary sector. Further, there were some scattered pockets in Rajasthan and Himachal Pradesh having very low WPR in secondary sector.

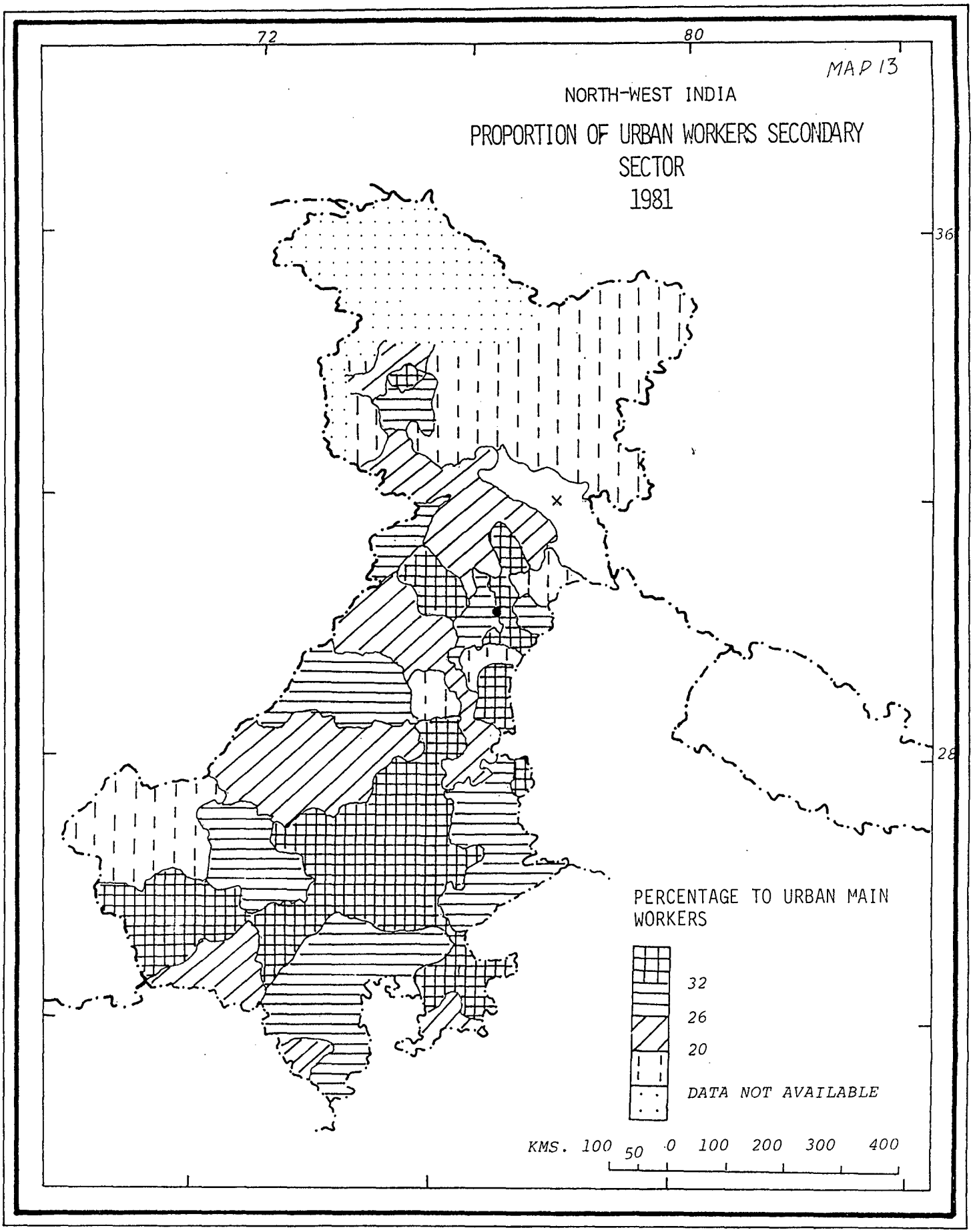
(Map 12, Table 10).

## Pattern of WPR in Secondary Sector in Urban Areas:

When the maps 12 and 13 showing WPR in secondary sector in total and urban areas are compared, it becomes explicit that the central districts of Rajasthan show a substantial increase in WPR in secondary sector in urban areas. But there is a decrease in some of the northern districts of Punjab in WPR in the urban secondary sector.

## Areas of High WPR in Urban Secondary Sector (above 32 per cent):

The districts along the Aravali range in Rajasthan exhibited high WPR in urban secondary sector. Further, there were some other scattered


72
80
MAP 13
NORTH-WEST INDIA
PROPORTION OF URBAN WORKERS SECONDARY SECTOR
1981
36
28
PERCENTAGE TO URBAN MAIN WORKERS
32
26
20
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

pockets in Rajasthan, Haryana, Punjab, Himachal Pradesh and Jammu and Kashmir having high proportion of workers in urban secondary sector.

(Map 13 , Table 10).

## Areas of Medium WPR in Urban Secondary Sector (26 per cent to 32 per cent):

The districts along the eastern boundary of Rajasthan besides some scattered pockets in Haryana, Punjab, Himachal Pradesh and Jammu and Kashmir exhibited medium WPR in urban secondary sector.

(Map 13, Table 10).

## Areas of Low WPR in Urban Secondary Sector (20 per cent to 26 per cent):

The south-western districts of Punjab, central Haryana, north-western Himachal Pradesh, northern and south-western Jammu and Kashmir showed low proportion of workers in urban secondary sector. Besides these, there were some scattered pockets in Rajasthan having low WPR in urban secondary sector.

(Map 13, Table 10).

Areas of Very Low WPR in Urban Secondary Sector (below 20 per cent):

The districts lying to the east of Anantnag in Jammu and Kashmir formed a contiguous area having very low proportion of workers in urban secondary sector. Further, there were some scattered pockets in western Jammu and Kashmir, Rajasthan, Haryana and Himachal Pradesh which had very low WPR in urban secondary sector.

(Map 13, Table 10).

Pattern of Workforce Participation Rate in Tertiary Sector:

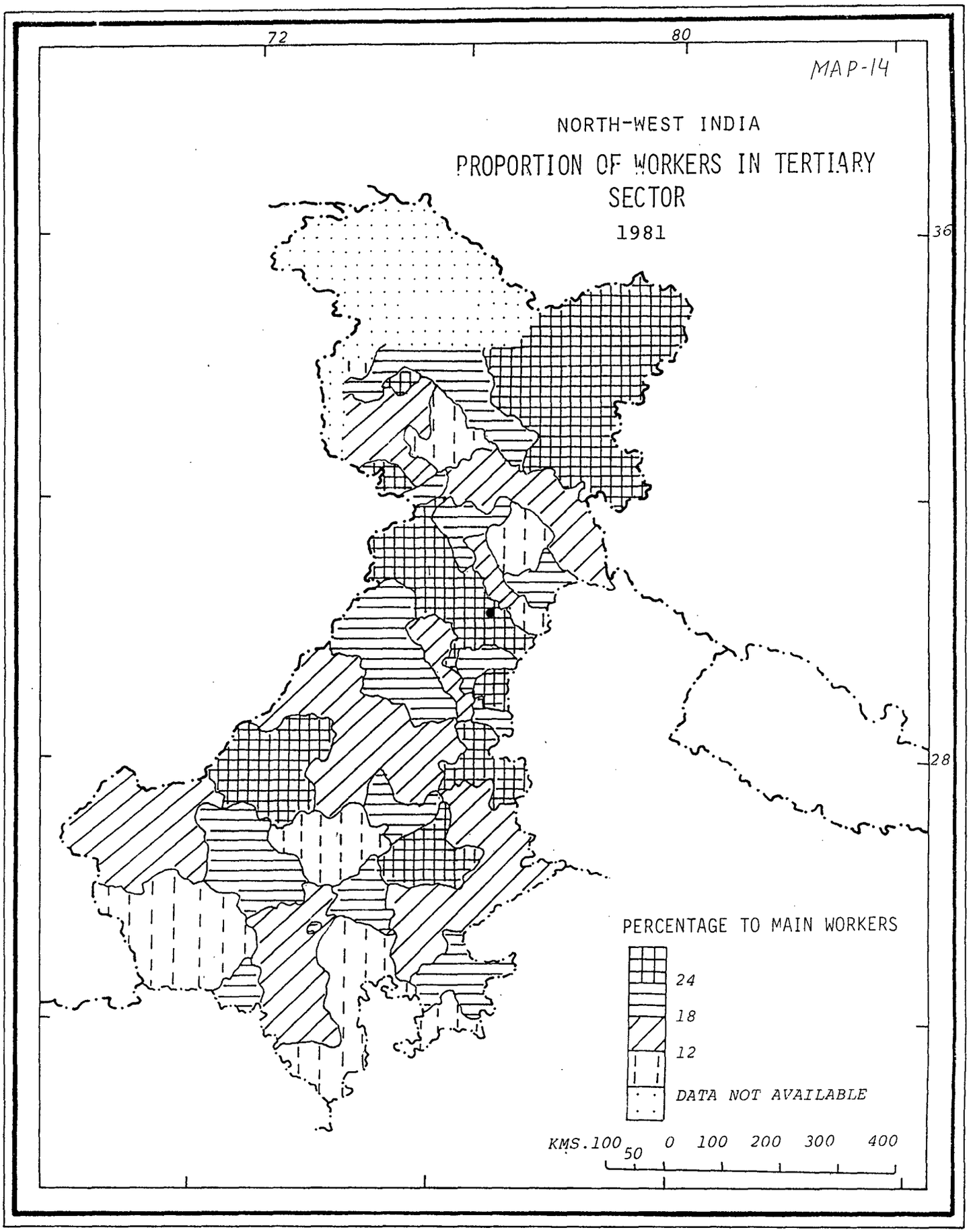
Areas of High WPR in Tertiary Sector (above 24 per cent)

The northern districts of Punjab-Haryana plain formed a contiguous area having high proportion of workers in tertiary sector. Further, the south-western districts of Haryana, few pockets in Rajasthan and Jammu and Kashmir also exhibited high WPR in tertiary sector.

(Map 14, Table 10).

Areas of Medium WPR in Tertiary Sector (18 per cent to 24 per cent):

The south-western districts of Punjab-Haryana plain and some more pockets in eastern


72
80
MAP-14
NORTH-WEST INDIA
PROPORTION OF WORKERS IN TERTIARY SECTOR
1981
36
28
PERCENTAGE TO MAIN WORKERS
24
18
12
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

Haryana, central and southern Rajasthan, western and southern Himachal Pradesh and northern Jammu and Kashmir exhibited medium proportion of workers in tertiary sector.

(Map 14, Table 10).

## Areas of Low WPR in Tertiary Sector (12 per cent to 18 per cent):

Most of the districts in the region showed low proportion of workers in tertiary sector. Further, such areas comprised the districts along the northern and eastern state boundary of Rajasthan, northern Himachal Pradesh, and central and western districts of Jammu and Kashmir.

(Map 14, Table 10).

## Areas of very Low WPR in Tertiary Sector (below 12 per cent):

The south-eastern and south-western districts of Rajasthan and few scattered pockets in Himachal Pradesh and Jammu and Kashmir exhibited high WPR in tertiary sector.

(Map 14, Table 10).

## Pattern of Workforce Participation in Tertiary Sector in Urban Areas:

### Areas of Very High WPR in Urban Tertiary Sector (above 62 per cent):

The southern, central and northern districts of Himachal Pradesh, southern districts of Jammu and Kashmir and few northern district of Punjab formed a contiguous area having high proportion of workers in urban tertiary sector. There were some more scattered pockets in western Rajasthan, Haryana and eastern Rajasthan having high WPR in urban tertiary sector.

(Map 15, Table 10).

### Areas of High WPR in Urban Tertiary Sector (56 per cent to 62 per cent):

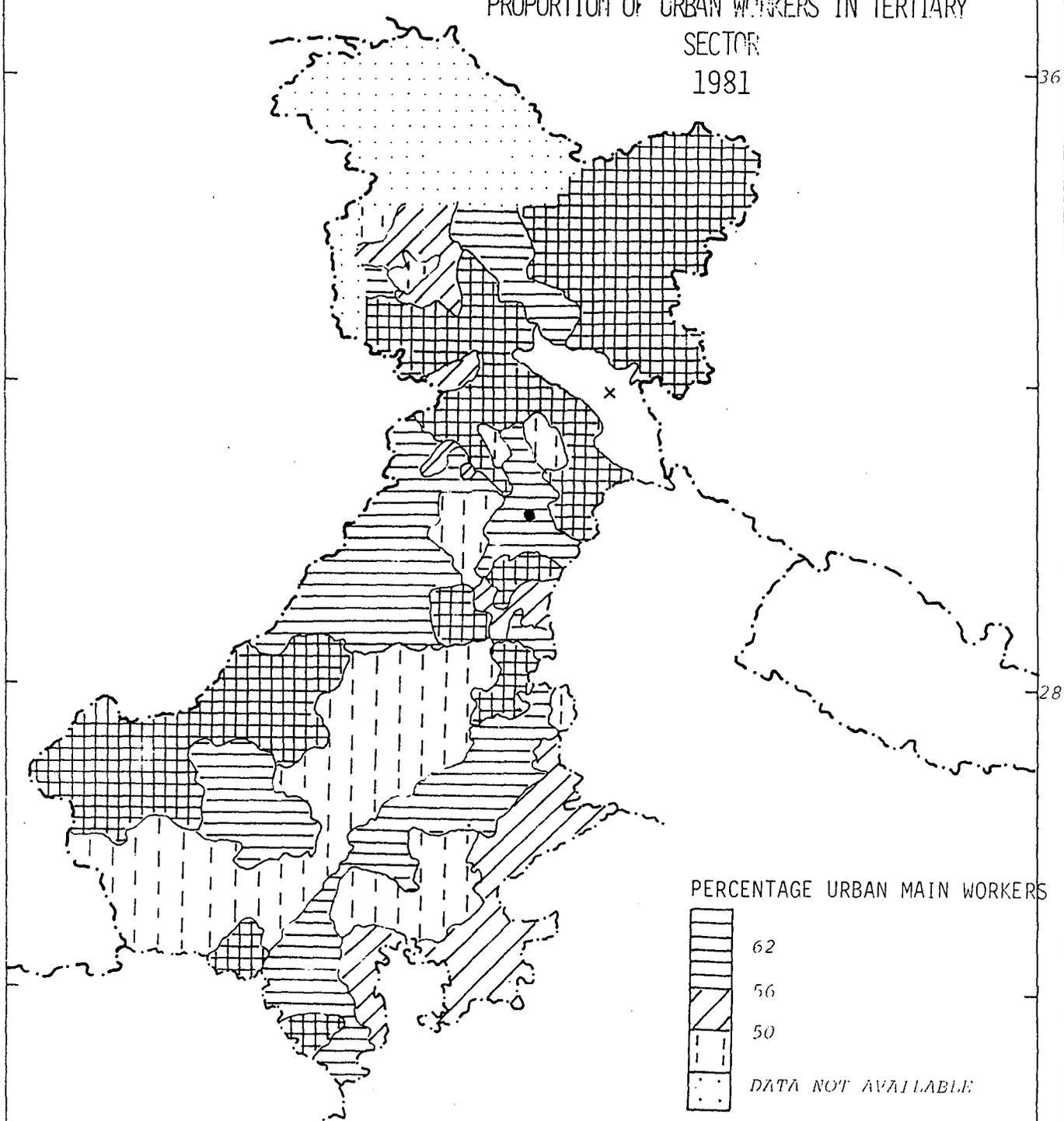
The districts along the Aravali range in Rajasthan and Haryana formed a contiguous belt having high proportion of workers in urban tertiary sector. Another such areas comprised the northern district of Rajasthan and south-western parts of Punjab-Haryana plain. The northern Haryana, north-eastern Punjab and south-western Himachal Pradesh

MAP 15

NORTH-WEST INDIA

PROPORTION OF URBAN WORKERS IN TERTIARY SECTOR

1981



also exhibited high WPR in urban tertiary sector, besides two scattered pockets in eastern and western Jammu and Kashmir.

(Map 15, Table 10).

## Areas of Medium WPR in Urban Tertiary Sector:

The districts along the eastern boundary of Rajasthan formed a contiguous area of medium proportion of workers in urban tertiary sector. Such scattered pockets were exhibited in Jammu and Kashmir, Haryana and Punjab.

(Map 15, Table 10).

## Areas of Low WPR in Urban Tertiary Sector:

Broadly speaking, the districts lying to the west of Aravali range in Rajasthan, exhibited a low proportion of workers in urban tertiary sector. Besides these, there were some scattered pockets in Rajasthan, Haryana, central Punjab, Himachal Pradesh and Jammu and Kashmir having low WPR in urban tertiary sector.

As it is obvious from the patterns of sectoral distribution of workforce in three main sectors, the secondary the tertiary sectors of the economy had a high proportion of workforce where there was

industrial development, state capitals, educational centres, Medical Colleges and Hospitals,as in some of the districts in Haryana and Punjab. The presence of army in stratagically important areas like that of north-west Jammu and Kashmir also kept the WPR higher in tertiary and secondary sector.

High proportion of workforce in primary sector is related to physical conditions like availability of rich alluvium and irrigation as in case of Haryana and Punjab. The high WPR in primary sector along Aravali range in Rajasthan may be correlated to the irrigation, though not very intensive, supplied by the streams or rivers (Chambal) descending from the range. Further, the highly urbanised and industrialised areas around union territory of Delhi, northern Punjab-Haryana plain, exhibited low proportion of workers in primary sectpr.

## Degree of Variability in Sectoral Distribution of Workforce:

Variations in the distribution of workforce in different sectors of the economy viz. primary, secondary and tertiary, were discussed in the previous section. Spatial variability in the proportion of workers in each sector was also reflected through

Table-11

Degree of variability in the Proportion of Workers in Primary, Secondary and Tertiary Sectors among Districts of States in North-West India, 1971 and 1981.

| States | Year | SD/CV | Primary sector | Secondary sector | Tertiary sector |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Jammu & Kashmir | 1971 | SD | 13.16 | 4.22 | 8.61 |
| | | CV | 17.34 | 64.35 | 51.33 |
| | 1981 | SD | 15.49 | 8.34 | 8.95 |
| | | CV | 22.48 | 72.90 | 45.43 |
| Himachal Pradesh | 1971 | SD | 9.42 | 5.39 | 7.62 |
| | | CV | 12.45 | 55.73 | 52.22 |
| | 1981 | SD | 7.51 | 6.27 | 3.61 |
| | | CV | 10.37 | 50.97 | 23.62 |
| Punjab | 1971 | SD | 8.42 | 4.55 | 4.42 |
| | | CV | 13.30 | 33.65 | 19.07 |
| | 1981 | SD | 8.88 | 5.23 | 4.45 |
| | | CV | 14.98 | 34.54 | 17.39 |
| Haryana | 1971 | SD | 8.72 | 3.72 | 5.47 |
| | | CV | 13.00 | 32.46 | 25.46 |
| | 1981 | SD | 9.67 | 6.44 | 4.18 |
| | | CV | 15.52 | 42.62 | 18.50 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Rajasthan | 1971 | SD | 7.57 | 2.58 | 5.37 |
| | | CV | 9.69 | 34.40 | 37.31 |
| | 1981 | SD | 8.15 | 3.22 | 5.33 |
| | | CV | 10.99 | 31.41 | 34.21 |

Where SD = Standard Deviation

CV = Coefficient of Variation.

Source: Computedfrom General Economic Tables Part II-B for 1971 and Part III A & B for 1981.

a discussion on the emerging pattern of the same. However, to get a clearer picture of degree of variability in three sectors, viz. primary, secondary and tertiary, among districts of each state in North-West India, standard deviation and coefficient of variation were computed to depicit the same.

The secondary sector had the highest variability (C.V.) among sectors followed by tertiary and primary sectors in all the states except Rajasthan. In primary sector, broadly speaking, the degree of variability among districts was highest in Jammu and Kashmir followed by Haryana, Punjab, Himachal Pradesh and Rajasthan. In secondary sector it was highest in Jammu and Kashmir followed by Himachal Pradesh, Haryana, Punjab and Rajasthan. In tertiary sector, the degree of variability (C.V.) was highest in Jammu and Kashmir and Himachal Pradesh, followed by Rajasthan, Haryana and Punjab.

High degree of variability in secondary and tertiary sectors reflects upon the variations in level of development in non-agricultural sectors which are confined to particular regions only. It should attract the attention of the planners to reduce the regional disparities in economic development. However, sectoral-shift resulting

from economic development processes reflects reduction in the degree of variability among various sectors of the economy. The following section deals with the pattern of sectoral-shift in north-west India.

## Sectoral-Shift of Labour Force, 1971-81:

Economic development leads to structural changes in the economy. One of the important structural changes is shift in the sectoral distribution of workforce in favour of the non-agricultural sector. While such shifts had been the experience of advanced countries, they are not so marked, consistent or fast in the over-populated developing countries, particularly those in Asia. In case of India, the proportion of workers employed in agriculture increased from 62.4 per cent in 1901 to 67.7 per cent in 1911 and it was relatively constant thereafter till 1951[4]. But this trend has been changing slowly under the impact of economic development plans.

It must be remembered that the recent decades since 1951 have seen the most massive investment ever

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4. *Sinha, J.N.: Demographic Trends in V.B.Singh (ed.) Economic History of India,1975, p.112.*

in the country in non-agricultural as well as agricultural sectors, that this investment must show objective measurable results by way of shifts, however small, in the different branches of industry and if the shifts fail to show up, then either there must be something wrong in the measurement, or the method of measurement itself is not sensitive enough, for not even the uniqueness of India can defy the universal behaviour of production, saving and investment.[5]

Further,the development plans have recognised the fact that there are wide variations in economic development between regions in a vast country like India. The lopsided industrial development during the later British period contributed to the widening of economic disparities between regions. One of the goals of the planning process today is to bridge this widening gulf between regions as far and as fast as possible.

It is in the light of the above facts that in this section, an attempt is made to analyse the pattern of change in sectoral distribution of workforce during 1971-81 at the district level.

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5. *Mitra, Asok: Census of India, 1961, Vol.I,Part IA (i), 'Levels of Regional Development in India' p.266.*

For the purpose of analysis the districts had been categorised into two broad groups: (a) areas comprising the districts in which the proportion of workers in primary sector decreased over the decade 1971-81 and (b) areas where the proportion of workers in primary sector increased over the decade 1971-81. These were further sub-divided into:

i. Districts where the proportionate share of workforce in primary sector had come down, while that of secondary and tertiary sectors had gone up (P↓ S↑ T↑).

ii. Districts where the proportionate share of workforce in primary and tertiary sectors had come down, but that of secondary sector had gone up (P↓ S↑ T↓).

iii. Districts where the proportionate share of workforce in the primary and secondary sector had gone up, but that of the tertiary sector had come down (P↑ S↑ T↓).

and iv. Districts where the proportionate share of workforce in primary and tertiary sectors had increased while that of secondary sector showed a downward trend ( P↑ S↓ T↑).

In case of north-west India as a whole, a sectoral-shift in labour force was exhibited. While in 1971, the proportion of total workers in primary sector was 72 per cent, it declined to 70 per cent in 1981. As for secondary sector it increased from 8.4 per cent to 13 per cent over the decade 1971-81. The proportion of total workers in tertiary sector declined from 19.5 per cent in 1971 to 16.3 per cent in 1981. In most of the districts also, there was a decline in the proportion of workforce in primary sector and it increased in the other two sectors viz. secondary and tertiary. In some of the districts - one each in Jammu and Kashmir (Srinagar), Himachal Pradesh (Lahul and Spiti) and Haryana (Ambala) there was a decline in the proportion of workforce in primary as well as tertiary sectors and an increase in secondary sector during the 1971-81 decade. In Rajasthan such districts were Jhunjhunun, Ajmer, Bundi and Jaisalmer.

In two districts, one in Himachal Pradesh (Shimla) and the other in Rajasthan (Jhalawar), there was an increase in the proportion of workforce in primary and secondary sectors but it declined in tertiary sector. Another two districts, namely, Kangra and Mandi had an increase in the proportion of

workforce in primary and tertiary sectors and a decline in secondary sector over the decade 1971-81. (Map 16, Table 12).

It would certainly be of interest to know as to why some districts exhibited an increase in the proportion of workforce in primary sector and the other showed a declining trend in it over the decade 1971-81. This aspect of the study could not be gone into because of dearth of data at the district level for such vital indices as per-capita income, sector-wise investment, sector-wise production etc. for two points of time viz. 1971 and 1981. In the following chapter an attempt has, however, been made to discern some of the socio-economic and demographic factors that are responsible for high or low workforce participation in north-west India.

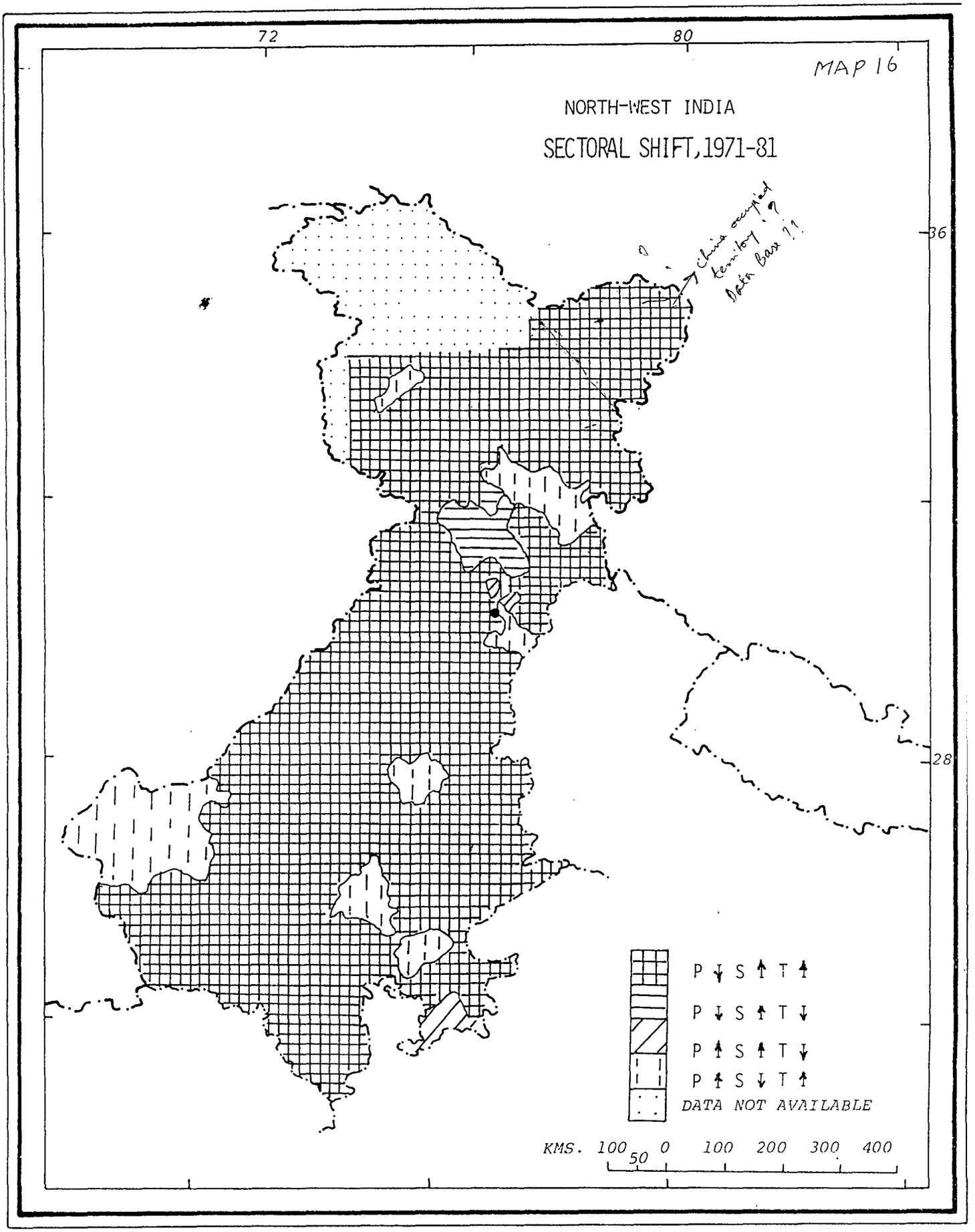
72
80
MAP 16
NORTH-WEST INDIA
SECTORAL SHIFT, 1971-81
China occupied territory ? Aksai Chin ??
36
28
P ↓ S ↑ T ↑
P ↓ S ↑ T ↓
P ↑ S ↑ T ↓
P ↑ S ↓ T ↑
DATA NOT AVAILABLE
KMS. 100 50 0 100 200 300 400

Table-12

Per cent Sectoral Distribution of Workforce and Sectoral-Shift in North-West India, 1971-81.

| District | Primary | | Secondary | | Tertiary | | Sectoral-shift 1971-81 | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1971 | 1981* | 1971 | 1981* | 1971 | 1981* | Primary | Secondary | Tertiary |
| Anantnag | 77.56 | 71.38 | 7.51 | 12.51 | 14.93 | 16.11 | -6.18 | 5.00 | 1.18 |
| Srinagar | 47.64 | 36.81 | 18.63 | 29.97 | 33.73 | 33.22 | -10.83 | 11.34 | -0.51 |
| Baramula | 79.14 | 70.36 | 6.33 | 13.16 | 14.53 | 16.48 | - 8.78 | 6.83 | 1.95 |
| Ladakh | 84.71 | 74.61 | 3.54 | 3.76 | 11.76 | 21.63 | -10.10 | 0.22 | 9.87 |
| Doda | 88.43 | 85.26 | 3.11 | 4.74 | 8.46 | 10.00 | - 3.17 | 1.63 | 1.54 |
| Udhampur | 80.55 | 75.00 | 6.10 | 8.56 | 13.35 | 16.44 | - 5.55 | 2.46 | 3.09 |
| Jammu | 55.73 | 50.04 | 11.79 | 13.84 | 32.48 | 36.12 | - 5.69 | 2.05 | 3.64 |
| Kathua | 71.80 | 70.02 | 11.22 | 11.32 | 16.98 | 18.66 | - 1.78 | 0.001 | 1.68 |
| Rajauri | 86.23 | 81.95 | 3.78 | 4.04 | 9.99 | 14.01 | - 4.28 | 0.26 | 4.02 |
| Punch | 87.13 | 79.33 | 2.95 | 4.50 | 9.92 | 16.17 | - 7.80 | 1.55 | 6.25 |
| Chamba | 86.67 | 73.44 | 3.76 | 14.72 | 9.57 | 11.84 | -13.23 | 10.96 | 2.27 |
| Kangra | 66.94 | 67.12 | 14.07 | 12.90 | 18.99 | 19.98 | 0.18 | -1.17 | 0.99 |
| Mandi | 77.62 | 79.54 | 11.93 | 9.21 | 10.45 | 11.25 | 1.92 | -2.72 | 0.08 |
| Kullu | 87.17 | 84.97 | 4.29 | 5.07 | 8.54 | 9.96 | -2.20 | 0.78 | 1.42 |
| Lahul & Spiti | 59.73 | 54.25 | 22.41 | 31.12 | 17.86 | 14.63 | -5.48 | 8.74 | -3.23 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Bilaspur | 82.67 | 77.79 | 5.98 | 9.19 | 11.35 | 18.02 | -4.88 | 3.21 | 1.67 |
| Mahasu | 68.50 | 73.77 | 4.65 | 6.82 | 9.85 | 19.41 | -11.73 | 2.17 | 9.56 |
| Simla | 55.92 | 69.94 | 9.19 | 12.69 | 34.89 | 17.37 | 14.02 | 3.5 | -17.52 |
| Sirmaur | 79.97 | 78.14 | 10.69 | 10.75 | 9.34 | 11.11 | -1.83 | 0.06 | 1.77 |
| Kinnaur | 75.12 | 71.03 | 9.82 | 11.08 | 15.06 | 17.89 | -4.09 | 1.26 | 2.83 |
| Gurdaspur | 59.74 | 57.06 | 12.42 | 14.40 | 27.84 | 28.54 | -2.68 | 1.98 | 0.7 |
| Amritsar | 56.68 | 54.56 | 15.04 | 15.63 | 28.28 | 29.81 | -2.12 | 0.59 | 1.53 |
| Firozepur | 74.85 | 70.04 | 7.51 | 9.63 | 17.64 | 20.33 | -4.81 | 2.12 | 2.69 |
| Ludhiana | 51.28 | 45.02 | 22.23 | 25.94 | 26.49 | 29.04 | -6.26 | 3.71 | 2.55 |
| Jalandhar | 51.31 | 47.60 | 20.35 | 21.35 | 28.34 | 31.05 | -3.71 | 1.00 | 2.71 |
| Kapurthala | 61.83 | 54.79 | 16.05 | 19.97 | 22.12 | 25.24 | -7.04 | 3.92 | 3.12 |
| Hoshiarpur | 62.05 | 58.34 | 13.24 | 13.68 | 24.71 | 27.98 | -3.71 | 0.44 | 3.27 |
| Ropar | 63.18 | 52.82 | 13.25 | 17.61 | 23.57 | 29.57 | -10.36 | 4.36 | 6.00 |
| Patiala | 64.53 | 58.57 | 12.11 | 14.17 | 23.36 | 27.26 | - 5.96 | 2.06 | 3.9 |
| Sngrur | 74.33 | 72.05 | 9.22 | 9.99 | 16.45 | 17.96 | - 2.28 | 0.77 | 1.51 |
| Bhatinda | 76.58 | 72.03 | 7.31 | 9.72 | 16.11 | 18.25 | - 4.55 | 2.41 | 2.14 |
| Ambala | 50.47 | 46.01 | 16.61 | 23.78 | 32.92 | 30.21 | - 4.46 | 7.17 | -2.71 |
| Karnal | 70.13 | 64.59 | 10.70 | 12.93 | 19.17 | 22.48 | - 5.54 | 2.23 | 3.31 |
| Rohtak | 64.47 | 59.86 | 11.57 | 14.81 | 23.96 | 25.33 | - 4.61 | 3.24 | 1.37 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Gurgaon | 59.58 | 50.48 | 17.17 | 24.10 | 23.25 | 25.42 | -9.10 | 6.93 | 2.17 |
| Mahendragarh | 74.43 | 61.03 | 6.72 | 14.31 | 18.85 | 24.66 | -13.40 | 7.59 | 5.81 |
| Hisar | 74.29 | 70.53 | 8.96 | 11.21 | 16.75 | 18.26 | - 3.76 | 2.25 | 1.51 |
| Jind | 75.92 | 75.44 | 8.54 | 8.63 | 15.54 | 15.93 | - 0.48 | 0.09 | 0.39 |
| Ganganagar | 78.75 | 73.83 | 7.15 | 9.14 | 14.10 | 17.03 | - 4.92 | 1.99 | 2.93 |
| Bikaner | 63.25 | 59.30 | 9.84 | 12.76 | 26.91 | 27.94 | - 3.95 | 2.92 | 1.03 |
| Churu | 82.15 | 77.78 | 5.53 | 7.66 | 12.32 | 14.56 | - 4.37 | 2.13 | 2.24 |
| Thunjhanun | 73.37 | 70.30 | 8.16 | 12.47 | 18.47 | 17.23 | - 3.07 | 4.31 | -1.24 |
| Alwar | 78.54 | 74.06 | 6.67 | 9.53 | 14.79 | 16.41 | - 4.48 | 1.86 | -2.62 |
| Bharatpur | 82.14 | 76.38 | 5.44 | 8.53 | 12.42 | 15.09 | - 5.76 | 3.09 | 2.67 |
| Swai Madhopur | 81.14 | 77.14 | 6.72 | 8.61 | 12.14 | 14.25 | - 4.00 | 1.89 | 2.11 |
| Jaipur | 63.52 | 55.58 | 13.14 | 18.31 | 23.34 | 26.11 | - 7.94 | 5.17 | 2.77 |
| Sikar | 75.11 | 67.97 | 9.91 | 13.87 | 14.98 | 18.16 | - 7.14 | 3.96 | 3.18 |
| Ajmer | 64.59 | 61.11 | 11.08 | 15.62 | 24.33 | 23.27 | - 3.48 | 4.54 | -1.06 |
| Tonk | 81.61 | 76.66 | 6.93 | 10.89 | 11.46 | 12.45 | -4.95 | 3.96 | 0.99 |
| Jaisalmer | 76.06 | 75.07 | 6.63 | 8.30 | 17.31 | 16.63 | -0.99 | 1.67 | -0.68 |
| Jodhpur | 70.83 | 66.80 | 8.10 | 11.51 | 21.07 | 21.69 | -4.03 | 3.41 | 0.62 |
| Nagaur | 84.40 | 80.77 | 7.16 | 8.88 | 8.44 | 10.35 | -3.63 | 1.72 | 1.96 |
| Poli | 75.66 | 72.67 | 11.02 | 13.68 | 13.32 | 13.65 | -2.99 | 2.66 | 0.33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Barmer | 88.89 | 85.67 | 3.21 | 5.88 | 7.90 | 9.45 | -3.22 | 2.67 | 0.55 |
| Jalor | 85.89 | 83.67 | 5.10 | 6.70 | 8.92 | 9.63 | -2.22 | 1.51 | 0.71 |
| Sirohi | 71.89 | 67.33 | 9.23 | 11.84 | 18.88 | 20.83 | -4.56 | 2.61 | 1.95 |
| Bhilwara | 84.18 | 81.69 | 6.58 | 8.23 | 9.24 | 10.08 | -2.49 | 1.65 | 0.84 |
| Udaipur | 78.94 | 74.75 | 6.89 | 9.56 | 14.17 | 15.69 | -4.19 | 2.67 | 1.52 |
| Chittaurgarh | 84.67 | 80.77 | 5.27 | 8.29 | 10.06 | 10.94 | -3.90 | 3.02 | 0.88 |
| Dungarpur | 88.01 | 84.17 | 3.58 | 5.31 | 8.41 | 10.52 | -3.84 | 1.73 | 2.11 |
| Banswara | 89.38 | 82.60 | 3.37 | 7.75 | 7.25 | 9.65 | -6.78 | 4.38 | 2.40 |
| Bundi | 78.66 | 77.59 | 9.42 | 9.98 | 12.92 | 12.43 | -0.07 | 0.56 | -0.49 |
| Kota | 66.68 | 61.26 | 12.36 | 16.15 | 20.96 | 22.59 | -5.42 | 3.79 | 1.63 |
| Thalawar | 83.30 | 83.43 | 6.58 | 7.04 | 10.12 | 9.53 | 0.13 | 0.46 | -0.59 |

Source: Economic Tables Part II B for 1971 and Part III A & B for 1981.

# CHAPTER - V

## FACTORS RESPONSIBLE FOR HIGH OR LOW WORKFORCE PARTICIPATION

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Chapter-III discussed the variability in workforce participation rates. This chapter would try to discuss the factors that are responsible for wide regional variations in it. This would be done by analysing zero-order correlations between WPRs and several of the explanatory variables. Multiple regression technique would be used to see the combined effect of the various explanatory variables. The first section of this chapter deals with the correlation tables for total as well as rural components of WPR in in 1971 and 1981, whereas the second section discusses the multiple regression technique results for total and rural WPR in 1971 and 1981.

In zero-order correlation and multiple regression analysis, the following explanatory variables were considered as plausible that could explain the variations in the WPRs.

Factors (Total):

$x_1$ = Percentage of Scheduled Caste Population to Total Population.

$x_2$ = Percentage of Urban Population to Total Population.

$x_3$ = Dependency ratio; Total.

$x_4$ = Literacy rate; Total.

$x_5$ = Sex-ratio; Total.

$x_6$ = Female workforce Participation rate; Total.

$x_7$ = Percentage of Total Workers in Primary Sector to Total Main Workers.

$x_8$ = Percentage of irrigated Area to Net Sown Area.

$x_9$ = Percentage of Area Sown More than Once to Net Sown Area.

Factors (Rural):

$x_1$ = Percentage of Rural Scheduled Caste Population to Rural Population.

$x_2$ = Dependency ratio; Rural.

$x_3$ = Literacy rates; Rural.

$x_4$ = Sex-ratio; Rural.

$x_5$ = Female Workforce Participation rate; Rural.

$x_6$ = Percentage of Rural Workers in primary Sector to Rural Main Workers.

$x_7 = x_8$ for Total.

$x_8 = x_9$ for Total.

## Zero-Order Correlation Analysis:

While discussing the pattern of workforce participation in Chapter III, some of the variables causing high or low WPR were brought out. However, the following discussion is an attempt to see the effect of each independent variable separately and test the hypotheses formulated in the introductory chapter.

## Proportion of Scheduled Caste Population:

Broadly speaking, a contradiction to the hypothesis that there is a positive correlation between the proportion of scheduled caste population and WPR was observed in the region as a whole. The case of insignificant negative correlation (-0.204; -0.27 and -0.182 and -0.369 respectively) was similar for both to total and rural area models in 1971 and 1981.

However, at the sub-regional level a confirmation of the hypothesis was exhibited in Rajasthan and Haryana states for both the total and rural area models both in 1971 and 1981. But the correlation was significant at 5 per cent

# TABLE - 13

## Per Cent Distribution of Independent Variables in Districts; North-West India, Total = 1971

| STATE/DISTRICTS | TWPR | Per Cent S.C. Population | Degree of urbanisation | Dependency Ratio | Literacy Rate | Sex Ratio | Female Work-force Participation Rate | Per Cent Workers in Primary Sector | Per Cent Area Irrigated to Net Area Sown | Per Cent Area Sown More than once to Net Area Sown |
|---|---|---|---|---|---|---|---|---|---|---|
| | y | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| JAMMU & KASHMIR | | | | | | | | | | N.A. |
| Anantnag | 31.10 | 0.01 | 8.91 | 85.55 | 14.97 | 84.80 | 3.03 | 77.56 | 59.88 | |
| Srinagar | 28.87 | 0.01 | 51.13 | 84.28 | 21.71 | 84.95 | 1.79 | 47.64 | 39.82 | |
| Baramula | 31.05 | 0.0 | 8.53 | 85.62 | 13.15 | 84.75 | 2.53 | 79.14 | 48.45 | |
| Ladakh | 43.76 | 0.0 | 7.51 | 78.38 | 12.69 | 97.48 | 29.24 | 84.71 | 100.00 | |
| Doda | 36.08 | 8.89 | 5.70 | 95.74 | 13.87 | 88.62 | 13.86 | 88.43 | 13.86 | |
| Udhampur | 31.19 | 19.59 | 8.38 | 102.96 | 15.61 | 90.79 | 4.51 | 80.55 | 9.45 | |
| Jammu | 24.44 | 28.22 | 26.14 | 107.90 | 30.33 | 91.98 | 1.63 | 55.73 | 26.88 | |
| Kathua | 26.71 | 22,83 | 9.13 | 110.41 | 21.63 | 92.09 | 2.35 | 71.80 | 46.30 | |
| Rajauri | 27.65 | 6.75 | 3.86 | 120.53 | 14.43 | 90.04 | 1.42 | 86.23 | 21.21 | |
| Punch | 27.77 | 0.11 | 8.08 | 107.26 | 12.85 | 90.29 | 0.71 | 87.13 | 36.20 | |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| HIMACHAL PRADESH | | | | | | | | | | |
| Chamba | 40.32 | 14.99 | 7.38 | 87.62 | 18.91 | 94.35 | 20.19 | 86.67 | 10.04 | 56.83 |
| Kangra | 27.46 | 17.59 | 3.66 | 105.74 | 37.52 | 102.82 | 10.62 | 66.94 | 22.32 | 78.54 |
| Mandi | 39.58 | 26.11 | 9.35 | 94.38 | 30.69 | 96.37 | 26.00 | 77.62 | 15.58 | 64.41 |
| Kullu | 48.63 | 25.13 | 5.59 | 83.27 | 24.37 | 91.98 | 36.97 | 87.17 | 12.89 | 56.71 |
| Lahul & spiti | 64.74 | 1.02 | 0.0 | 59.91 | 28.47 | 81.41 | 61.34 | 59.63 | 87.02 | 3.62 |
| Bilaspur | 40.53 | 24.46 | 4.87 | 100.52 | 32.87 | 99.25 | 31.83 | 82.67 | 6.29 | 74.14 |
| Mahasu | 47.13 | 28.78 | 3.65 | 84.88 | 28.74 | 91.12 | 35.07 | 85.50 | 6.57 | 59.81 |
| Simla | 35.79 | 20.17 | 31.83 | 80.77 | 38.33 | 84.29 | 11.71 | 55.92 | 17.94 | 63.20 |
| Sirmaur | 42.47 | 16.21 | 8.45 | 79.51 | 24.38 | 83.54 | 18.21 | 79.97 | 27.85 | 74.88 |
| Kinnaur | 60.51 | 9.94 | 0.0 | 73.35 | 27.69 | 88.71 | 54.88 | 75.12 | 26.73 | 39.13 |
| PUNJAB | | | | | | | | | | |
| Gurdaspur | 26.42 | 21.72 | 20.26 | 103.24 | 34.22 | 89.03 | 1.03 | 59.74 | 52.32 | 40.69 |
| Amritsar | 29.13 | 22.81 | 29.17 | 94.88 | 35.31 | 85.60 | 1.40 | 56.68 | 93.78 | 51.03 |
| Firozepur | 29.90 | 22.79 | 19.84 | 99.81 | 27.78 | 87.01 | 1.06 | 74.85 | 77.02 | 30.92 |
| Ludhiana | 29.57 | 23.76 | 34.80 | 86.07 | 42.62 | 84.63 | 1.42 | 51.28 | 84.65 | 55.69 |

Contd.

13
3

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Jalandhar | 27.10 | 32.85 | 30.05 | 94.31 | 41.30 | 85.90 | 1.41 | 51.31 | 80.70 | 38.73 |
| Kapurthala | 27.77 | 24.72 | 23.20 | 99.90 | 35.69 | 88.30 | 1.08 | 61.83 | 79.01 | 17.42 |
| Hoshiarpur | 26.19 | 28.84 | 12.09 | 98.48 | 40.88 | 89.93 | 1.09 | 62.05 | 22.29 | 42.21 |
| Ropar | 28.06 | 22.60 | 15.15 | 95.32 | 36.61 | 85.34 | 1.02 | 63.18 | 34.74 | 65.83 |
| Patiala | 29.36 | 20.89 | 26.03 | 96.58 | 31.51 | 84.69 | 1.43 | 64.53 | 66.79 | 42.37 |
| Sangrur | 31.32 | 23.66 | 20.31 | 92.63 | 24.22 | 84.02 | 0.82 | 74.33 | 77.40 | 41.42 |
| Bhatinda | 30.73 | 26.90 | 19.99 | 90.89 | 23.29 | 85.45 | 0.87 | 76.58 | 77.90 | 34.78 |
| HARYANA | | | | | | | | | | |
| Hisar | 28.18 | 21.73 | 15.93 | 112.24 | 22.95 | 86.57 | 2.94 | 74.29 | 43.60 | 28.78 |
| Rohtak | 23.65 | 17.43 | 15.67 | 106.26 | 30.75 | 88.17 | 2.22 | 64.47 | 34.60 | 43.08 |
| Gurgaon | 26.11 | 16.17 | 18.50 | 107.04 | 28.13 | 86.03 | 2.37 | 59.58 | 32.15 | 33.19 |
| Karnal | 27.04 | 18.84 | 17.01 | 108.79 | 24.82 | 85.41 | 1.77 | 70.13 | 70.43 | 46.13 |
| Ambala | 23.37 | 22.39 | 31.38 | 96.35 | 35.53 | 85.93 | 1.66 | 50.47 | 21.07 | 46.28 |
| Jind | 26.72 | 19.09 | 13.24 | 114.07 | 18.56 | 85.87 | 2.57 | 75.92 | 46.05 | 50.87 |
| Mahendragarh | 25.60 | 14.95 | 10.21 | 110.89 | 26.02 | 90.03 | 4.16 | 74.43 | 11.37 | 52.41 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| RAJASTHAN | | | | | | | | | | |
| Ganganagar | 28.8 | 36.21 | 16.48 | 112.18 | 20.18 | 87.39 | 2.3 | 78.75 | 35.0 | 26.0 |
| Bikaner | 28.9 | 20.78 | 41.37 | 101.44 | 25.81 | 90.13 | 6.7 | 63.25 | 1.02 | 3.0 |
| Churu | 30.1 | 21.68 | 29.57 | 112.64 | 18.95 | 94.63 | 10.0 | 82.15 | 0.01 | 10.01 |
| Jhunjhunun | 25.3 | 15.46 | 17.43 | 109.18 | 23.25 | 92.83 | 4.5 | 73.37 | 10.0 | 30.0 |
| Alwqr | 28.0 | 20.40 | 9.12 | 106.84 | 19.72 | 88.66 | 4.5 | 78.54 | 38.0 | 36.0 |
| Bharatpur | 28.9 | 22.44 | 13.76 | 101.93 | 19.01 | 80.97 | 2.7 | 82.14 | 30.0 | 19.0 |
| Swai Madhopur | 32.3 | 24.04 | 11.90 | 96.72 | 16.29 | 86.40 | 8.6 | 81.14 | 24.0 | 14.0 |
| Jaipur | 30.4 | 16.06 | 30.04 | 96.92 | 24.31 | 88.97 | 7.9 | 63.52 | 42.0 | 22.0 |
| Sikar | 26.9 | 15.08 | 17.02 | 107.23 | 19.61 | 96.11 | 6.0 | 75.11 | 16.0 | 17.0 |
| Ajmer | 34.8 | 12.70 | 37.64 | 90.71 | 30.30 | 91.04 | 16.2 | 64.59 | 20.0 | 20.0 |
| Tonk | 33.9 | 21.76 | 17.44 | 93.07 | 15.35 | 90.91 | 11.3 | 81.61 | 16.0 | 10.0 |
| Jaisalmer | 31.7 | 19.20 | 14.59 | 89.35 | 13.40 | 80.99 | 4.3 | 76.06 | 0.01 | 0.01 |
| Jodhpur | 30.3 | 16.13 | 31.94 | 96.99 | 21.38 | 89.96 | 7.7 | 70.83 | 3.0 | 3.0 |
| Nagaur | 34.0 | 22.41 | 12.27 | 103.11 | 15.09 | 94.21 | 15.0 | 84.40 | 4.0 | 13.0 |
| Pali | 32.2 | 19.77 | 11.17 | 101.19 | 17.19 | 94.99 | 10.9 | 75.66 | 20.0 | 11.0 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Barmer | 34.1 | 20.69 | 7.25 | 95.43 | 10.58 | 88.67 | 9.2 | 88.89 | 1.0 | 1.5 |
| Jalor | 31.5 | 21.24 | 4.42 | 101.85 | 10.12 | 93.15 | 6.8 | 85.89 | 17.0 | 20.0 |
| Sirohi | 29.8 | 19.96 | 17.86 | 100.36 | 16.92 | 95.75 | 6.1 | 71.89 | 28.0 | 16.0 |
| Bhilwara | 39.3 | 18.38 | 11.02 | 81.65 | 15.10 | 90.96 | 15.5 | 84.18 | 29.0 | 29.0 |
| Udaipur | 32.0 | 8.76 | 12.30 | 91.40 | 17.41 | 95.68 | 7.6 | 78.94 | 26.0 | 45.0 |
| Chittaur-garh | 38.7 | 16.65 | 10.35 | 85.52 | 17.51 | 92.97 | 17.0 | 84.67 | 24.0 | 42.0 |
| Dungarpur | 27.9 | 5.14 | 5.89 | 105.56 | 14.31 | 101.53 | 5.6 | 88.01 | 7.0 | 42.0 |
| Banswara | 28.0 | 5.85 | 5.07 | 109.55 | 12.42 | 97.82 | 4.5 | 89.38 | 8.0 | 30.0 |
| Bundi | 33.1 | 20.21 | 14.59 | 93.02 | 16.00 | 88.53 | 8.4 | 77.66 | 40.0 | 27.0 |
| Kota | 30.9 | 19.13 | 24.04 | 93.52 | 25.28 | 88.41 | 6.7 | 66.68 | 24.0 | 15.0 |
| Jhalawar | 31.9 | 19.72 | 9.45 | 96.83 | 17.60 | 91.95 | 7.6 | 83.30 | 10.0 | 25.0 |

*SOURCE* : *(i) Economic Tables for respective states, Part II-B, 1971.*

*(ii) Statistical Abstracts for respective states 1972-73.*

*(iii) Special Tables on Scheduled Caste Population,India,Part V-A(i),1971.*

## TABLE - 14

Per Cent Distribution of Independent Variables in Districts; North-West India - Rural, 1981

| STATE/DISTRICTS | WPR | Per Cent S.C. Population | Dependency Ratio | Literacy Rate | Sex Ratio | Per Cent Female Work-force to female Population | Per Cent | Per Cent Area Irrigated to Net Area Sown | Per Cent Area Sown More than once to Net Area Sown |
|---|---|---|---|---|---|---|---|---|---|
| | Y | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| JAMMU AND KASHMIR | | | | | | | | | |
| Anantnag | 31.50 | 0.01 | 85.67 | 13.60 | 84.69 | 3.20 | 81.52 | 59.88 | N.A. |
| Srinagar | 31.49 | 0.0 | 86.68 | 10.91 | 84.44 | 1.88 | 70.80 | 39.82 | |
| Baramula | 31.40 | 0.0 | 85.75 | 11.53 | 84.64 | 2.54 | 83.53 | 48.45 | |
| Ladakh | 43.98 | 0.0 | 79.35 | 10.96 | 98.51 | 29.72 | 88.21 | 100.00 | |
| Doda | 36.58 | 9.27 | 96.09 | 11.90 | 88.82 | 14.37 | 91.17 | 13.86 | |
| Udhampur | 31.60 | 20.32 | 104.35 | 12.25 | 91.17 | 4.58 | 86.08 | 9.45 | |
| Jammu | 23.97 | 34.14 | 117.80 | 22.05 | 94.02 | 1.21 | 74.24 | 26.88 | |
| Kathua | 26.88 | 2.31 | 111.76 | 19.47 | 92.22 | 2.29 | 76.67 | 46.30 | |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Rajauri | 27.66 | 6.74 | 121.74 | 13.23 | 90.29 | 1.35 | 89.25 | 21.20 | N.A. |
| Punch | 28.18 | 0.05 | 108.09 | 11.86 | 90.47 | 0.55 | 90.74 | 36.20 | |
| HIMACHAL PRADESH | | | | | | | | | |
| Chamba | 41.28 | 14.90 | 88.47 | 15.72 | 95.04 | 21.19 | 91.02 | 10.04 | 56.83 |
| Kangra | 27.39 | 17.85 | 107.69 | 37.03 | 103.50 | 10.76 | 74.02 | 22.32 | 78.54 |
| Mandi | 39.68 | 27.25 | 99.19 | 27.34 | 100.01 | 27.64 | 84.70 | 15.58 | 64.41 |
| Kullu | 49.31 | 25.91 | 85.19 | 22.17 | 93.49 | 38.35 | 90.52 | 12.89 | 56.71 |
| Lahul and spiti | 64.74 | - | 59.91 | 28.47 | 81.41 | 61.34 | 59.34 | 87.02 | 3.62 |
| Bilaspur | 40.86 | 24.77 | 102.26 | 31.55 | 100.51 | 32.73 | 85.12 | 6.29 | 74.14 |
| Mahasu | 47.56 | 29.87 | 86.14 | 27.38 | 92.26 | 35.93 | 87.72 | 6.57 | 59.81 |
| Simla | 35.41 | 29.60 | 94.23 | 25.56 | 91.31 | 13.55 | 81.39 | 17.94 | 63.20 |
| Sirmaur | 43.68 | 17.71 | 79.88 | 21.33 | 83.68 | 19.31 | 84.43 | 27.85 | 74.88 |
| Kinnaur | 60.51 | 9.94 | 73.25 | 27.69 | 88.71 | 54.88 | 75.12 | 26.73 | 39.13 |
| PUNJAB | | | | | | | | | |
| Gurdaspur | 26.50 | 22.97 | 107.81 | 29.96 | 89.28 | 0.68 | 72.77 | 52.32 | 40.69 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Amritsar | 24.86 | 26.92 | 104.13 | 26.88 | 86.64 | 0.92 | 77.50 | 93.78 | 51.03 |
| Firozepur | 30.49 | 24.37 | 103.08 | 22.53 | 86.88 | 0.74 | 88.11 | 77.02 | 30.92 |
| Ludhiana | 29.36 | 30.82 | 92.30 | 35.29 | 85.90 | 0.82 | 76.68 | 84.65 | 55.69 |
| Jalandhar | 27.25 | 37.29 | 99.86 | 35.10 | 88.50 | 0.77 | 69.69 | 80.70 | 38.73 |
| Kapurthala | 27.61 | 26.78 | 105.85 | 29.65 | 90.48 | 0.49 | 79.25 | 79.01 | 17.42 |
| Hoshiarpur | 26.06 | 30.57 | 101.39 | 38.47 | 90.37 | 0.83 | 69.38 | 22.29 | 42.21 |
| Ropar | 28.12 | 23.81 | 97.93 | 33.73 | 85.44 | 0.63 | 72.79 | 34.74 | 65.83 |
| Patiala | 29.86 | 25.01 | 103.36 | 23.76 | 84.42 | 0.68 | 82.41 | 66.79 | 42.37 |
| Sangrur | 32.13 | 25.63 | 93.42 | 20.38 | 83.17 | 0.46 | 84.62 | 77.40 | 41.42 |
| Bhatinda | 31.53 | 28.77 | 91.49 | 18.31 | 85.11 | 0.50 | 88.58 | 77.90 | 34.78 |
| HARYANA | | | | | | | | | |
| Hisar | 28.48 | 23.20 | 116.46 | 18.51 | 87.14 | 3.06 | 85.29 | 43.60 | 28.78 |
| Rohtak | 23.51 | 18.58 | 113.57 | 26.71 | 88.47 | 2.07 | 74.62 | 34.60 | 43.08 |
| Gurgaon | 25.73 | 17.30 | 112.42 | 22.70 | 86.84 | 2.12 | 69.41 | 32.15 | 33.19 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Karnal | 27.13 | 20.85 | 113.42 | 19.18 | 85.30 | 1.39 | 81.26 | 70.43 | 46.13 |
| Ambala | 27.74 | 32.63 | 103.74 | 26.16 | 85.22 | 0.98 | 70.10 | 21.07 | 46.28 |
| Jind | 26.91 | 20.30 | 116.26 | 14.85 | 86.08 | 2.71 | 84.05 | 46.05 | 50.87 |
| Mahendragarh | 25.76 | 15.14 | 110.89 | 24.12 | 103.59 | 4.39 | 80.36 | 11.37 | 52.41 |
| RAJASTHAN | | | | | | | | | |
| Ganganagar | 29.2 | 25.38 | 115.94 | 15.39 | 88.55 | 3.1 | 90.52 | 35.0 | 26.0 |
| Bikaner | 32.5 | 20.25 | 108.02 | 11.71 | 90.78 | 8.8 | 90.67 | 1.02 | 3.0 |
| Churu | 33.4 | 19.99 | 114.83 | 12.07 | 93.52 | 13.2 | 95.11 | 0.01 | 10.01 |
| Jhunjhunun | 26.0 | 14.02 | 110.44 | 20.79 | 93.37 | 4.9 | 81.72 | 10.0 | 30.0 |
| Alwar | 28.3 | 17.71 | 108.39 | 16.94 | 89.19 | 4.6 | 84.46 | 38.0 | 36.0 |
| Bharatpur | 29.4 | 21.14 | 102.31 | 15.93 | 84.00 | 2.7 | 90.32 | 30.0 | 19.0 |
| Swai Madhopur | 33.0 | 21.47 | 96.88 | 13.68 | 86.56 | 9.3 | 87.74 | 24.0 | 14.0 |
| Jaipur | 32.0 | 18.21 | 101.88 | 14.11 | 90.28 | 9.7 | 83.22 | 42.0 | 22.0 |
| Sikar | 28.0 | 13.49 | 107.16 | 16.91 | 96.02 | 6.9 | 84.34 | 16.0 | 17.0 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Ajmer | 39.0 | 16.93 | 93.66 | 16.00 | 93.11 | 22.0 | 87.85 | 20.0 | 20.0 |
| Tonk | 35.3 | 20.47 | 92.78 | 11.69 | 91.09 | 12.3 | 90.57 | 16.0 | 10.0 |
| Jaisalmer | 32.0 | 14.48 | 90.65 | 8.72 | 82.27 | 4.5 | 86.14 | 0.01 | 0.01 |
| Jodhpur | 32.8 | 15.06 | 101.41 | 10.62 | 91.61 | 9.5 | 91.60 | 3.0 | 3.0 |
| Nagaur | 35.3 | 18.45 | 103.60 | 12.43 | 94.83 | 16.6 | 90.66 | 4.0 | 13.0 |
| Pali | 32.8 | 15.33 | 102.16 | 14.62 | 95.88 | 11.7 | 81.26 | 20.0 | 11.0 |
| Barmer | 34.6 | 14.43 | 95.96 | 8.38 | 89.24 | 9.7 | 93.46 | 1.0 | 1.5 |
| Jalor | 31.8 | 16.32 | 102.29 | 8.95 | 93.40 | 6.9 | 88.20 | 17.0 | 20.0 |
| Sirohi | 30.8 | 17.99 | 101.90 | 10.90 | 96.84 | 6.6 | 81.97 | 28.0 | 16.0 |
| Bhilwara | 40.3 | 16.11 | 81.61 | 11.83 | 91.46 | 16.5 | 89.51 | 29.0 | 29.0 |
| Udaipur | 32.7 | 7.76 | 93.29 | 12.69 | 96.95 | 8.0 | 86.93 | 26.0 | 45.0 |
| Chittaur-garh | 39.9 | 13.99 | 85.51 | 14.36 | 93.45 | 18.3 | 89.70 | 24.0 | 42.0 |
| Dungarpur | 28.2 | 3.85 | 106.60 | 12.04 | 102.08 | 5.7 | 91.80 | 7.0 | 42.0 |
| Banswara | 28.2 | 3.70 | 110.56 | 10.28 | 98.04 | 4.5 | 93.12 | 8.0 | 30.0 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Bundi | 34.5 | 19.11 | 93.41 | 11.66 | 88.43 | 9.1 | 85.67 | 40.0 | 27.0 |
| Kota | 31.4 | 19.19 | 96.61 | 18.29 | 90.19 | 7.2 | 84.16 | 24.0 | 15.0 |
| Jhalawar | 32.6 | 17.21 | 96.86 | 14.54 | 92.22 | 7.8 | 88.59 | 10.0 | 25.0 |

*SOURCE : (i) Economic Tables for respective states, Part II-B,1971,*

*(ii) Statistical Abstracts for respective states, 1972-73.*

*(iii) Special tables for Scheduled Caste population, India,Part V-A(i),19[illegible].*

## TABLE - 15

Per Cent Distribution of Independent Variables in Districts; North-West India - Total, 1981.

| STATE/DISTRICTS | TWPR | Per Cent S.C. Population | Degree of Urbanisation | Dependency Ratio | Literacy Rate | Sex Ratio | Per Cent Female Worker to Female Population | Per Cent Workers in Primary Sector | Per Cent Area irrigated to Net Area Sown | Per Cent Area Sown More Than Once to Net Area Sown |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| JAMMU AND KASHMIR | | | | | | | | | | |
| Anantnag | 31.67 | 0.0 | 10.70 | 85.58 | 22.93 | 88.76 | 7.48 | 71.71 | 63.08 | N.A. |
| Pulwama | 29.04 | 0.0 | 8.97 | 88.88 | 22.69 | 89.62 | 2.59 | 80.82 | 61.27 | |
| Srinagar | 30.12 | 0.01 | 80.49 | 73.31 | 33.89 | 87.29 | 5.24 | 23.40 | 72.64 | |
| Badgam | 32.80 | 0.01 | 14.12 | 86.23 | 17.99 | 87.95 | 5.78 | 60.54 | 62.59 | |
| Baramula | 31.42 | 0.01 | 13.39 | 86.68 | 20.62 | 87.03 | 5.81 | 64.91 | 49.21 | |
| Kupwara | 30.37 | 0.0 | 2.94 | 87.76 | 16.82 | 85.82 | 3.46 | 81.87 | 50.77 | |
| Kargil | 45.32 | 0.01 | 5.34 | 70.50 | 18.85 | 85.32 | 33.93 | 78.47 | 96.11 | |
| Ladakh(Leh) | 43.54 | 0.30 | 12.74 | 73.80 | 25.16 | 88.64 | 28.22 | 70.70 | 96.60 | |
| Doda | 40.53 | 8.74 | 5.91 | 92.56 | 18.50 | 90.39 | 13.76 | 85.26 | 25.75 | |
| Udhampur | 31.62 | 18.74 | 9.53 | 96.12 | 23.51 | 90.63 | 5.62 | 75.00 | 9.18 | |



Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Kathua | 28.82 | 22.84 | 11.37 | 95.52 | 31.90 | 91.68 | 5.05 | 70.02 | 11.94 | |
| Jammu | 26.65 | 28.35 | 29.64 | 88.30 | 42.85 | 91.75 | 2.86 | 50.04 | 52.65 | |
| Rajauri | 27.58 | 7.44 | 5.23 | 106.53 | 24.72 | 90.63 | 3.07 | 81.95 | 10.19 | |
| Punch | 27.72 | 0.09 | 6.32 | 95.71 | 23.39 | 88.92 | 2.30 | 79.33 | 14.46 | |
| HIMACHAL PRADESH | | | | | | | | | | |
| Chamba | 35.11 | 19,73 | 3.42 | 84.45 | 26.45 | 93.55 | 13.63 | 73.44 | 8.68 | 53.92 |
| Kangra | 26.67 | 20.20 | 4.93 | 92.19 | 49.11 | 101.62 | 9.09 | 65.17 | 29.44 | 78.92 |
| Hamirpur | 24.71 | 23.59 | 4.98 | 105.57 | 52.69 | 114.92 | 13.45 | 72.19 | 3.76 | 74.03 |
| Una | 23.49 | 22.45 | 7.72 | 98.97 | 55.03 | 102.83 | 3.58 | 68.74 | 5.63 | 66.35 |
| Bilaspur | 31.79 | 25.98 | 4.68 | 95.73 | 38.30 | 100.18 | 18.23 | 77.79 | 7.74 | 79.55 |
| Mandi | 37.42 | 28.17 | 7.32 | 93.69 | 40.20 | 99.94 | 26.47 | 79.54 | 15.11 | 73.55 |
| Kullu | 45.08 | 28.41 | 7.08 | 80.88 | 33.82 | 91.83 | 33.22 | 84.97 | 7.33 | 57.47 |
| Lahul and spiti | 59.08 | 2.25 | 0.0 | 58.05 | 31.34 | 76.65 | 49.99 | 54.25 | 100.00 | 6.89 |
| Shimla | 46.40 | 26.76 | 15.69 | 74.44 | 42.73 | 87.75 | 34.69 | 73.77 | 6.42 | 45.09 |
| Solan | 34.51 | 31.77 | 10.75 | 88.09 | 29.91 | 92.90 | 16.38 | 69.94 | 17.85 | 59.58 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Sirmaur | 40.21 | 30.02 | 8.74 | 84.11 | 31.78 | 87.34 | 19.38 | 78.14 | 24.64 | 75.96 |
| Kinnaur | 54.66 | 10.63 | 0.0 | 72.04 | 36.83 | 88.45 | 46.76 | 71.03 | 53.89 | 37.03 |
| PUNJAB | | | | | | | | | | |
| Gurdaspur | 26.56 | 23.69 | 21.69 | 87.54 | 43.49 | 90.73 | 1.73 | 57.06 | 66.0 | 66.66 |
| Amritsar | 29.64 | 26.20 | 32.97 | 84.09 | 41.04 | 87.06 | 2.26 | 54.56 | 97.1 | 66.18 |
| Firozepur | 30.49 | 20.89 | 22.79 | 86.82 | 32.28 | 88.36 | 2.45 | 70.15 | 87.7 | 58.43 |
| Ludhiana | 30.38 | 25.18 | 42.01 | 71.90 | 50.60 | 85.93 | 2.50 | 45.02 | 90.6 | 73.78 |
| Jalandhar | 27.98 | 36.27 | 35.31 | 80.76 | 49.17 | 89.28 | 2.51 | 47.60 | 90.5 | 60.88 |
| Kapurthala | 28.56 | 26.98 | 29.97 | 82.04 | 44.85 | 89.79 | 2.39 | 54.79 | 84.4 | 42.85 |
| Hoshiarpur | 26.38 | 30.83 | 14.44 | 83.35 | 50.09 | 91.48 | 2.30 | 58.34 | 41.1 | 50.99 |
| Rupnagar | 28.82 | 24.38 | 21.57 | 79.77 | 48.07 | 86.10 | 2.68 | 52.82 | 42.3 | 54.26 |
| Patiala | 29.90 | 22.12 | 29.59 | 78.80 | 40.44 | 86.34 | 2.45 | 58.57 | 76.5 | 70.73 |
| Sangrur | 31.47 | 25.47 | 22.80 | 77.65 | 29.57 | 86.03 | 1.90 | 72.05 | 88.6 | 65.86 |
| Bhatinda | 30.84 | 27.01 | 22.67 | 80.90 | 27.71 | 86.42 | 2.03 | 70.33 | 73.9 | 55.97 |
| Faridkot | 30.20 | 31.67 | 23.92 | 81.29 | 33.51 | 88.19 | 2.14 | 69.87 | 85.6 | 55.51 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| HARYANA | | | | | | | | | | |
| Ambala | 29.02 | 23.48 | 32.90 | 82.24 | 44.62 | 87.10 | 2.76 | 46.01 | 40.6 | 40.82 |
| Kurukshetra | 28.67 | 20.28 | 16.46 | 91.93 | 32.39 | 86.29 | 2.40 | 70.07 | 76.2 | 65.12 |
| Karnal | 29.07 | 17.95 | 26.17 | 90.94 | 36.77 | 85.40 | 3.69 | 59.98 | 89.5 | 41.95 |
| Jind | 29.24 | 19.25 | 13.80 | 96.36 | 26.17 | 85.41 | 6.00 | 75.44 | 66.8 | 54.51 |
| Sonipat | 28.21 | 16.79 | 17.95 | 90.62 | 40.85 | 86.56 | 7.79 | 60.20 | 73.0 | 35.56 |
| Rohtak | 26.70 | 17.21 | 19.82 | 93.77 | 42.54 | 88.27 | 6.79 | 59.64 | 59.8 | 29.41 |
| Faridabad | 29.42 | 15.65 | 40.82 | 87.87 | 39.19 | 81.26 | 3.64 | 42.74 | 47.9 | 42.69 |
| Gurgaon | 27.79 | 14.20 | 19.91 | 95.62 | 35.22 | 88.02 | 4.56 | 60.14 | 38.3 | 21.97 |
| Mahendragarh | 23.61 | 10.43 | 13.06 | 99.26 | 38.61 | 93.07 | 2.41 | 61.03 | 31.4 | 37.03 |
| Bhiwani | 28.09 | 18.33 | 16.01 | 104.11 | 33.0- | 89.81 | 8.40 | 71.17 | 31.7 | 49.40 |
| Hisar | 29.96 | 21.93 | 19.28 | 94.05 | 29.96 | 86.65 | 5.53 | 69.93 | 65.0 | 46.39 |
| Sirsa | 29.74 | 25.26 | 20.43 | 91.65 | 29.87 | 87.74 | 2.67 | 71.29 | 72.6 | 31.40 |
| RAJASTHAN | | | | | | | | | | |
| Ganganagar | 29.48 | 29.04 | 20.60 | 96.19 | 26.01 | 87.41 | 2.84 | 73.83 | 41.67 | 29.61 |
| Bikaner | 29.31 | 18.35 | 39.47 | 93.73 | 28.19 | 89.13 | 5.89 | 59.30 | 2.79 | 5.92 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Churu | 29.49 | 19.54 | 29.22 | 102.33 | 21.84 | 95.35 | 9.70 | 77.78 | 0.05 | 14.80 |
| Jhunjhunun | 25.03 | 14.91 | 20.73 | 104.31 | 28.61 | 95.63 | 7.29 | 70.30 | 12.78 | 34.24 |
| Alwar | 26.72 | 17.63 | 11.07 | 101.66 | 26.52 | 89.24 | 4.31 | 74.06 | 40.00 | 38.14 |
| Bharatpur | 27.27 | 21.29 | 17.07 | 99.82 | 26.04 | 83.14 | 2.72 | 76.38 | 32.92 | 21.26 |
| Swai Madhopur | 28.86 | 21.36 | 13.41 | 93.47 | 23.23 | 86.65 | 6.12 | 77.14 | 27.91 | 17.50 |
| Jaipur | 29.36 | 16.26 | 36.55 | 91.11 | 31.40 | 89.35 | 8.81 | 55.58 | 45.59 | 26.54 |
| Sikar | 24.62 | 13.75 | 9.01 | 102.20 | 25.42 | 96.25 | 4.82 | 67.97 | 18.37 | 21.66 |
| Ajmer | 35.83 | 18.38 | 42.79 | 81.17 | 35.30 | 92.21 | 18.79 | 61.11 | 23.90 | 23.35 |
| Tonk | 33.87 | 20.63 | 18.35 | 79.48 | 29.56 | 92.76 | 14.17 | 76.66 | 18.60 | 11.21 |
| Jaisalmer | 32.08 | 14.51 | 13.54 | 86.29 | 15.79 | 81.12 | 3.79 | 75.07 | 0.04 | 0.61 |
| Jodhpur | 30.59 | 15.51 | 34.76 | 90.99 | 26.64 | 90.92 | 9.78 | 66.80 | 4.98 | 4.80 |
| Nagaur | 33.10 | 19.17 | 14.55 | 97.92 | 19.37 | 95.75 | 15.65 | 80.77 | 5.33 | 15.42 |
| Pali | 32.06 | 17.72 | 18.42 | 96.85 | 21.86 | 94.64 | 12.84 | 72.67 | 23.93 | 13.12 |
| Barmer | 31.85 | 15.63 | 8.77 | 95.99 | 3.77 | 90.40 | 8.53 | 85.67 | 1.40 | 2.61 |
| Jalor | 29.40 | 17.02 | 8.06 | 104.16 | 13.69 | 94.18 | 6.60 | 83.67 | 19.56 | 22.49 |
| Sirohi | 29.45 | 18.74 | 17.89 | 85.08 | 20.06 | 96.26 | 8.62 | 67.33 | 31.57 | 18.42 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bhilwara | 38.50 | 17.00 | 14.38 | 81.93 | 19.79 | 94.15 | 18.86 | 81.69 | 31.37 | 30.39 |
| Udaipur | 30.13 | 8.20 | 15.06 | 90.46 | 22.01 | 97.74 | 7.89 | 74.75 | 28.00 | 47.42 |
| Chittaurgarh | 37.81 | 14.47 | 13.17 | 86.66 | 21.94 | 95.10 | 18.71 | 80.77 | 27.01 | 45.68 |
| Dungarpur | 27.19 | 4.51 | 6.46 | 96.34 | 18.51 | 104.47 | 7.02 | 84.17 | 9.44 | 48.81 |
| Banswara | 27,97 | 4.71 | 6.22 | 99.55 | 16.85 | 98.41 | 6.44 | 82.60 | 11.00 | 36.69 |
| Bundi | 33.93 | 18.90 | 17.00 | 87.80 | 20.14 | 88.72 | 11.81 | 77.59 | 44.49 | 29.95 |
| Kota | 30.40 | 18.81 | 31.93 | 88.63 | 32.52 | 88.76 | 8.31 | 61.26 | 29.02 | 19.75 |
| Jhalawar | 35.95 | 17.10 | 20.55 | 96.73 | 22.11 | 92.62 | 17.14 | 83.43 | 12.09 | 27.12 |

*SOURCE:* *(i) Economic Tables for respective states, Part III A and B, 1981.*

*(ii) Statistical Abstracts for respective states, 1982-83.*

*(iii) Special Tables for Scheduled caste population,India,PartV-(i),1981.*

## TABLE - 16

Per Cent Distribution of Independent Variables in Districts; North-West India, Rural - 1981.

| STATE/DISTRICTS | WPR | Per Cent S.C. Population | Dependency Ratio | Literacy Rate | Sex Ratio | Per Cent Female Workers to Female Population | Per Cent Workers in Primary Sector | Per Cent Irrigated Area to Net Sown Area | Per Cent Area Sown More than once to Net Area Sown |
|---|---|---|---|---|---|---|---|---|---|
| | Y | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| JAMMU AND KASHMIR | | | | | | | | | |
| Anantnag | 31.93 | 0.0 | 87.32 | 20.75 | 88.71 | 7.72 | 77.09 | 63.08 | N.A. |
| Pulwama | 29.10 | 0.0 | 90.01 | 19.12 | 89.56 | 2.52 | 74.66 | 61.27 | |
| Srinagar | 33.23 | 0.0 | 89.18 | 14.24 | 88.33 | 6.44 | 70.74 | 72.64 | |
| Badgam | 33.54 | 0.0 | 87.58 | 14.62 | 88.10 | 5.87 | 65.80 | 62.59 | |
| Kupwara | 30.38 | 0.0 | 88.02 | 16.31 | 85.87 | 3.47 | 82.97 | 50.77 | |
| Kargil | 45.58 | 0.0 | 70.95 | 17.58 | 85.89 | 34.47 | 81.18 | 96.11 | |
| Ladakh(Leh) | 43.27 | 0.24 | 76.66 | 22.29 | 91.12 | 29.19 | 78.31 | 96.60 | |
| Doda | 33.75 | 9.12 | 94.28 | 16.19 | 90.78 | 14.25 | 88.91 | 25.75 | |
| Udhampur | 31.87 | 19.51 | 88.88 | 19.46 | 90.84 | 5.59 | 81.59 | 9.18 | |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Kathua | 28.93 | 22.97 | 98.46 | 29.12 | 91.97 | 5.10 | 75.61 | 11.94 | N.A. |
| Jammu | 26.34 | 34.05 | 96.74 | 35.74 | 93.09 | 2.16 | 67.40 | 52.65 | |
| Rajauri | 27.41 | 7.55 | 108.63 | 29.54 | 91.12 | 2.95 | 85.79 | 10.19 | |
| Punch | 27.87 | 0.09 | 97.61 | 21.02 | 88.88 | 2.10 | 22.71 | 14.46 | |
| HIMACHAL PRADESH | | | | | | | | | |
| Chamba | 35.38 | 19.78 | 86.15 | 23.67 | 93.81 | 13.83 | 77.71 | 8.68 | 53.92 |
| Kangra | 26.48 | 20.57 | 93.49 | 48.38 | 102.17 | 9.04 | 68.05 | 29.44 | 78.92 |
| Hamirpur | 24.37 | 24.00 | 107.63 | 51.90 | 117.00 | 13.63 | 75.83 | 3.76 | 74.03 |
| Una | 23.24 | 22.61 | 100.85 | 49.36 | 103.74 | 3.58 | 72.61 | 5.63 | 66.35 |
| Bilaspur | 31.72 | 26.27 | 97.57 | 43.51 | 101.26 | 18.50 | 80.81 | 7.74 | 79.55 |
| Mandi | 37.85 | 28.97 | 96.82 | 37.84 | 101.69 | 27.74 | 84.22 | 15.11 | 73.55 |
| Kullu | 45.66 | 29.46 | 83.28 | 31.06 | 93.60 | 34.72 | 89.60 | 7.33 | 57.47 |
| Lahul and spiti | 59.08 | 2.25 | 58.05 | 31.34 | 76.65 | 49.99 | 54.25 | 100.00 | 6.89 |
| Shimla | 47.34 | 28.72 | 81.26 | 37.15 | 92.27 | 38.18 | 84.73 | 6.42 | 45.09 |
| Solan | 34.31 | 33.09 | 92.47 | 38.15 | 94.87 | 17.08 | 78.23 | 17.85 | 59.58 |
| Sirmaur | 41.26 | 30.98 | 85.69 | 28.72 | 87.56 | 20.52 | 82.87 | 26.64 | 75.96 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Kinnaur | 54.66 | 10.63 | 72.04 | 36.83 | 88.45 | 46.76 | 71.03 | 53.89 | 37.03 |
| PUNJAB | | | | | | | | | |
| Gurdaspur | 26.49 | 25.14 | 91.00 | 40.01 | 90.83 | 1.38 | 70.63 | 66.0 | 66.66 |
| Amritsar | 29.65 | 30.82 | 90.73 | 33.38 | 87.57 | 1.81 | 76.94 | 97.1 | 66.18 |
| Firozepur | 31.04 | 21.82 | 89.53 | 26.36 | 88.52 | 2.05 | 85.90 | 87.7 | 58.43 |
| Ludhiana | 29.62 | 33.29 | 77.55 | 43.69 | 87.93 | 1.75 | 73.28 | 99.6 | 73.78 |
| Jalandhar | 27.47 | 41.50 | 85.77 | 44.09 | 90.47 | 2.14 | 70.41 | 90.5 | 60.88 |
| Kapurthala | 27.95 | 30.73 | 85.72 | 40.25 | 91.92 | 1.67 | 73.58 | 84.4 | 42.85 |
| Hoshiarpur | 26.06 | 32.29 | 86.02 | 48.29 | 92.24 | 2.03 | 66.34 | 41.1 | 50.99 |
| Rupnagar | 28.46 | 26.32 | 83.37 | 43.78 | 53.59 | 1.88 | 65.53 | 42.3 | 54.26 |
| Patiala | 29.99 | 26.94 | 83.72 | 32.39 | 86.43 | 1.33 | 77.88 | 76.5 | 70.73 |
| Sangrur | 32.15 | 27.87 | 77.72 | 25.72 | 85.39 | 1.50 | 84.21 | 88.6 | 65.86 |
| Bhatinda | 30.99 | 29.16 | 83.02 | 21.99 | 86.68 | 1.40 | 85.78 | 73.9 | 55.97 |
| Faridkot | 30.66 | 34.11 | 82.51 | 28.84 | 88.79 | 1.69 | 85.28 | 85.6 | 55.51 |
| HARYANA | | | | | | | | | |
| Ambala | 29.06 | 24.09 | 89.95 | 35.81 | 86.50 | 1.92 | 66.44 | 40.6 | 40.82 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Kurukshetra | 28.75 | 24.13 | 95.49 | 27.79 | 86.37 | 2.16 | 80.84 | 76.2 | 65.12 |
| Karnal | 28.77 | 20.31 | 97.76 | 29.73 | 84.90 | 3.22 | 77.76 | 89.5 | 41.95 |
| Jind | 29.57 | 20.40 | 98.78 | 22.42 | 85.35 | 6.48 | 83.25 | 66.8 | 54.51 |
| Sonipat | 28.31 | 17.94 | 94.53 | 36.76 | 83.89 | 8.53 | 71.08 | 73.0 | 35.56 |
| Rohtak | 26.78 | 18.15 | 99.79 | 38.31 | 88.49 | 7.38 | 71.40 | 59.8 | 29.41 |
| Faridabad | 27.31 | 18.21 | 102.63 | 27.64 | 84.95 | 3.37 | 71.99 | 47.9 | 42.69 |
| Gurgaon | 28.00 | 13.88 | 100.38 | 29.18 | 88.20 | 4.65 | 71.58 | 38.3 | 21.97 |
| Mahendragarh | 23.21 | 16.99 | 102.47 | 36.02 | 93.81 | 2.30 | 69.39 | 31.4 | 37.03 |
| Bhiwani | 28.14 | 18.62 | 108.47 | 29.54 | 90.78 | 9.41 | 82.18 | 31.7 | 49.40 |
| Hisar | 30.18 | 23.33 | 98.48 | 24.32 | 87.16 | 6.02 | 82.75 | 65.0 | 46.39 |
| Sirsa | 29.84 | 32.18 | 95.62 | 24.31 | 88.70 | 2.68 | 86.11 | 72.6 | 31.40 |
| RAJASTHAN | | | | | | | | | |
| Ganganagar | 29.72 | 31.32 | 101.22 | 20.48 | 88.83 | 2.87 | 87.76 | 41.67 | 29.61 |
| Bikaner | 31.74 | 23.19 | 103.07 | 13.51 | 90.61 | 7.48 | 85.22 | 2.79 | 5.92 |
| Churu | 31.91 | 22.71 | 106.65 | 14.62 | 95.57 | 12.57 | 93.15 | 0.05 | 14.80 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Jhunjhunun | 25.65 | 14.96 | 106.08 | 25.76 | 96.88 | 8.42 | 80.73 | 12.78 | 34.24 |
| Alwar | 26.78 | 18.02 | 104.51 | 22.86 | 90.00 | 4.37 | 81.82 | 40.00 | 38.14 |
| Bharatpur | 27.68 | 21.40 | 102.49 | 22.23 | 82.83 | 2.66 | 86.64 | 32.92 | 21.26 |
| Swai Madhopur | 29.44 | 21.58 | 94.35 | 20.00 | 86.72 | 6.48 | 84.91 | 27.91 | 17.50 |
| Jaipur | 30.70 | 18.37 | 99.73 | 20.03 | 91.01 | 11.34 | 79.57 | 45.59 | 26.54 |
| Sikar | 25.34 | 14.31 | 103.09 | 22.42 | 96.51 | 5.44 | 79.64 | 18.37 | 21.66 |
| Ajmer | 41.91 | 17.64 | 87.94 | 19.17 | 94.83 | 21.51 | 86.51 | 23.90 | 23.35 |
| Tonk | 35.09 | 21.29 | 88.62 | 16.51 | 93.27 | 15.54 | 86.81 | 18.60 | 11.21 |
| Jaisalmer | 32.36 | 15.23 | 87.61 | 10.54 | 82.20 | 3.89 | 84.32 | 0.04 | 0.61 |
| Jodhpur | 32.85 | 17.09 | 98.51 | 14.23 | 92.82 | 12.48 | 90.06 | 4.98 | 4.80 |
| Nagaur | 34.39 | 20.33 | 98.54 | 16.58 | 96.52 | 17.56 | 87.88 | 5.33 | 15.42 |
| Pali | 33.01 | 18.45 | 99.33 | 17.95 | 96.05 | 14.58 | 81.42 | 23.93 | 13.12 |
| Barmer | 32.32 | 15.71 | 97.49 | 9.33 | 91.14 | 9.08 | 91.24 | 1.40 | 2.61 |
| Jalor | 29.72 | 17.09 | 105.67 | 11.47 | 94.75 | 6.83 | 87.87 | 19.56 | 22.49 |
| Sirohi | 29.95 | 19.01 | 100.96 | 13.46 | 98.14 | 9.31 | 78.42 | 31.57 | 18.42 |
| Bhilwara | 40.15 | 17.29 | 82.20 | 15.53 | 94.77 | 20.88 | 88.10 | 31.37 | 30.39 |

Contd.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Udaipur | 30.56 | 7.89 | 94.05 | 15.78 | 99.47 | 8.28 | 84.65 | 28.00 | 47.42 |
| Chittaurgarh | 39.21 | 14.70 | 87.76 | 17.37 | 96.08 | 20.45 | 87.58 | 27.01 | 45.68 |
| Dungarpur | 27.43 | 4.26 | 97.77 | 15.88 | 105.55 | 7.20 | 88.35 | 9.44 | 48.81 |
| Banswara | 27.98 | 4.61 | 101.63 | 14.03 | 99.15 | 6.49 | 87.55 | 11.00 | 36.69 |
| Bundi | 35.53 | 19.27 | 89.15 | 15.00 | 88.64 | 13.31 | 86.31 | 44.49 | 29.95 |
| Kota | 31.50 | 20.61 | 94.05 | 22.80 | 90.46 | 9.71 | 82.49 | 29.02 | 19.75 |
| Jhalawar | 37.21 | 17.69 | 97.96 | 18.10 | 92.96 | 18.61 | 89.18 | 12.09 | 27.12 |

*SOURCE* : *(i) Economic Tables for respective states, Part III A and B, 1981.*

*(ii) Statistical Abstracts for respective states, 1982-83.*

*(iii) Special Tables for Scheduled Caste Population,India, Part V-A(i),1981.*

Table-17

Zero-order Correction Between Each Independent Factor and Total Work Force Participation

| 1971 Total | No.of Distt. | % S.C. Population $x_1$ | % urban population $x_2$ | Dependency Ratio $x_3$ | Literacy Rate $x_4$ | Sex Ratio $x_5$ | AWD FWR $x_6$ | Total PSWR $x_7$ | Irrigated area to net area sown. $x_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Regression Equation | 64 | -0.204 | -0.411* | -0.762** | -0.06 | 0.009 | 0.955** | 0.26 | 0.015 |

| Rural | | % S.C. population $x_1$ | Dependency Ratio $x_2$ | Literacy Rate $x_3$ | Sex Ratio $x_4$ | FWR $x_5$ | PSWR $x_6$ | Irrigated area to net area sown. $x_7$ |
|---|---|---|---|---|---|---|---|---|
| Regression Equation | 64 | -0.27 | -0.814** | -0.002 | -0.022 | 0.891** | 0.035 | 0.0008 |

| 1981 TOTAL | No.of Distt. | % S.C. Population $x_1$ | % urban population $x_2$ | Dependency Ratio $x_3$ | Literacy Ratio $x_4$ | Sex Ratio $x_5$ | FWPR $x_6$ | PSWR $x_7$ | Irrigated area to net area sown. $x_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Regression equation | 76 | -0.182 | -0.259 | -0.64** | -0.174 | -0.173 | 0.914** | 0.197 | 0.119 |

| | | % S.C. population $x_1$ | Dependency Ratio $x_2$ | Literacy Ratio $x_3$ | Sex Ratio $x_4$ | FWPR $x_5$ | PSWR $x_6$ | Irrigated area to net area sown. $x_7$ |
|---|---|---|---|---|---|---|---|---|
| Rural | | | | | | | | |
| Regression equation | 76 | -0.369 | 0.253 | -0.324 | 0.083 | -0.006 | -0.409* | 0.258 |

CAT

ZERO-ORDER CORRELATION EQUATIONS
TOTAL, 1971.

Table-18

| 1971 | No.of Distt. | % S.C. Population | % urban population | Dependency ratio | Literacy Rate | Sex Ratio | FWPR | PSWPR | % irrigated area to net area sown. | % area sown mor than onc to net area sow |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ | $x_8$ | $x_9$ |
| Jammu and Kashmir | 10 | -0.449 | -0.293 | -0.656* | -0.584 | 0.374 | 0.942** | 0.458 | 0.581 | - |
| Himachal Pradesh | 10 | -0.56 | -0.47 | -0.84 | -0.41 | -0.607 | 0.955* | -0.026 | 0.62 | -0.87* |
| Punjab | 11 | -0.33 | 0.21 | -0.57 | -0.71* | -0.76* | -0.22 | 0.59 | 0.58 | 0.008 |
| Haryana | 7 | 0.05 | -0.509 | 0.775* | -0.829* | -0.275 | 0.276 | 0.713* | 0.553 | -0.381 |
| Rajasthan | 26 | 0.095 | -0.103 | -0.814** | -0.205 | -0.118 | 0.843** | 0.21 | 0.109 | 0.004 |

ZERO-ORDER CORREATION EQUATIONS.
RURAL, 1971

Table-19

| RURAL | No.of Dist. | % S.C. population $x_1$ | Dependency Ratio $x_2$ | Literacy Rate $x_3$ | Sex Ratio $x_4$ | FWPR $x_5$ | PSWR $x_6$ | % irrigated area to net area sown. $x_7$ | % area sown more than once to net area sown. $x_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Jammu and Kashmir | 10 | -0.429 | -0.742* | -0.437 | -0.135 | 0.524* | 0.14 | 0.574* | - |
| Himachal Pradesh | 10 | -0.61* | -0.91** | -0.19 | -0.73* | 0.95** | -0.43 | 0.60* | -0.86* |
| Punjab | 11 | -0.314 | -0.197 | -0.609* | -0.425 | -0.402 | -0.947** | 0.265 | 0.569* |
| Haryana | 7 | 0.587 | -0.065 | -0.52 | -0.55 | -0.15 | 0.37 | 0.25 | -0.21 |
| Rajasthan | 26 | 0.192 | -0.751** | -0.296 | -0.109 | 0.88** | 0.248 | 0.032 | -0.92 |

ZERO-ORDER CORRELATION EQUATIONS
TOTAL - 1981

Table-20

| | No.of Distt. | % S.C. Population | % urban population | Dependency Ratio | Literacy Rate | Sex Ratio | FWPR | PSWPR | % irrigated area to net area sown. | % area sown more than to net area sown. |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ | $x_8$ | $x_9$ |
| Jammu & Kasimir | 14 | -0.314 | 0.19** | -0.609* | -0.425 | -0.402 | 0.947** | 0.265 | 0.569* | - |
| Himachal Pradesh | 12 | -0.562 | -0.477 | -0.846 | -0.416 | -0.607 | 0.95* | -0.026 | 0.62 | -0.87* |
| Punjab | 12 | -0.31 | 0.27 | -0.46 | -0.69* | -0.83** | 0.013 | 0.48 | 0.57* | 0.28 |
| Haryana | 12 | 0.491 | 0.408 | -0.44 | -0.38 | -0.755* | 0.045 | 0.078 | 0.501 | 0.291 |
| Rajasthan | 20 | 0.168 | 0.146 | -0.68** | -0.13 | -0.038 | 0.85** | 0.1 | 0.041 | -0.058 |

ZERO-ORDER CORRELATION EQUATIONS.

Table-21. RURAL - 1981.

| Rural | No.of Distt. | % S.C. Population | Dependency Ratio | Literacy Rate | Sex Ratio | FWPR | PSWPR | % Irrigated area to net area sown. | % area sown more than once to net area sown. |
|---|---|---|---|---|---|---|---|---|---|
| | | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ | $x_8$ |
| Jammu and Kashmir | 14 | -0.410 | -0.374** | -0.417 | -0.359 | 0.961** | 0.113 | 0.718* | - |
| Himachal Pradesh | 12 | -0.477 | -0.93** | -0.65* | -0.36** | 0.96** | -0.19 | 0.69* | -0.81** |
| Punjab | 12 | -0.27 | -0.45 | -0.36** | -0.062 | -0.29 | 0.87** | 0.53* | 0.27 |
| Haryana | 12 | 0.557* | -0.38 | -0.604* | -0.63* | 0.124 | 0.583* | 0.536* | 0.272 |
| Rajasthan | 26 | 0.164 | -0.726** | -0.28 | -0.03 | 0.81** | 0.38 | 0.008 | -0.083 |

leval only in Haryana, and that too, for rural areas in 1981 only.

The negative correlation was exhibited in the west Himalayan States of Jammu and Kashmir and Himachal Pradesh. The case was similar for both the total and rural areas in 1971 and 1981. The negative correlation between proportion of scheduled caste population and WPR was significant at 5 per cent level in Himachal Pradesh for rural areas in 1971. This may be due to the fact that in Himachal Pradesh, several districts have high proportion of tribal population and little scheduled caste population. Further, the state of Punjab also exhibited insignificant negative correlation both for the total and rural areas in 1971 and 1981.

(Table 17 - 27).

## Degree of Urbanisation:

The hypothesis that there is a negative correlation between degree of urbanisation and workforce participation rate was confirmed in the region as a whole. This correlation existed in both the total and rural area models in 1971 and 1981. However, the negative correlation between degree of urbanisation and WPR was significant at 5 per cent level in 1971 only. At the state level

in 1971, the negative correlation existed in Jammu and Kashmir, Himachal Pradesh, Haryana and Rajasthan. However, in 1981, the case was similar only in Himachal Pradesh.

The positive correlation between degree of urbanisation and WPR was exhibited in Punjab in 1971 whereas, in 1981, such states were Jammu and Kashmir, Punjab, Haryana and Rajasthan where the correlation was significant at 5 per cent level. Hence,it was a case of rejection of hypothesis in the states mentioned above.

(Table 17 - 21).

## Dependency Ratio:

The confirmation of the hypothesis that there is a negative correlation between dependency ratio and workforce participation rate was exhibited in the region as a whole, and at state level also the case was similar. The negative correlation in the northern zone of India was significant for both the total and rural areas at 1 per cent level in 1971 and for total areas it was at 5 per cent level only in 1981.

At the state level in 1971 the significant correlation was shown in the states of Jammu and

Kashmir at 5 per cent level; total and rural; Himachal Pradesh (at 5 per cent level in rural areas only), Haryana and Rajasthan (1 per cent level; total and rural). In 1981 the similar case was exhibited in the states of Jammu and Kashmir (1 per cent level; total and rural), Himachal Pradesh (1 per cent level; rural) and Rajasthan (1 per cent level; rural). However, the state of Haryana (1971; total) was the only exceptional case, where a positive correlation was exhibited at 5 per cent level.

(Table 17 - 21).

## Literacy Rate:

Confirmation of the hypothesis that there is a negative correlation between literacy rate and workforce participation rate was observed in the north-west India as a whole and the state level as well, for both the total and rural areas in 1971 and 1981. Among states such a negative correlation was significant in Punjab and Haryana at 5 per cent level for total areas and only Punjab (at 5 per cent level) for rural areas in 1971. In 1981, the states exhibited a significant negative correlation between literacy rate and WPR were Punjab (at 5 per cent level) for total area model and Himachal Pradesh (at 5 per cent level), Punjab (at 1 per cent level) and Haryana

(at 5 per cent level) for rural area model.

(Tables, 17 -21).

## Sex-Ratio:

This factor exhibited, by and large, a negative correlation which workforce participation rate. In 1971 the negative correlation was significant in the states of Punjab (at 5 per cent level) for total area model and Himachal Pradesh (at 5 per cent level) for rural area model. In 1981, such states were Punjab (at 1 per cent level) and Haryana (at 5 per cent level) for total areas and Himachal Pradesh (at 1 per cent level) and Haryana (at 5 per cent level) for rural area model.

However, the cases of exception to the above hypothesis were total area, 1971 and rural area, 1981 models for the region as a whole. In the states of Jammu and Kashmir (1971) and Rajasthan (1981) the total area models also exhibited an insignificant positive correlation between sex-ratio and WPR.

(Tables, 17 -21).

## Proportion of Workers in Primary Sector:

The variation in proportion of workers in primary sector was, by and large, positively correlated

to WPR in all the states (except Himachal Pradesh) in northern zone of India. The case was similar for both total and rural area models in 1971 and 1981. The positive correlation was significant in the states of Haryana (st 5 per cent level) for total area and Punjab (at 1 per cent level) for rural area models in 1971. In 1981 such states were Punjab (at 1 per cent level) and Haryana (at 5 per cent level) for rural area model only.

(Tables, 17 -21).

## Proportion of Irrigated Area:

This factor exhibited a positive correlation with WPR in all the states and the region as a whole. Hence the hypothesis that with an increase in proportion of irrigated area to net area sown, there is an increase in the proportion of workers. In 1971, the states of Jammu and Kashmir (at 5 per cent level) and Himachal Pradesh (at 5 per cent level) for rural area model only showed a significant positive correlation. In 1981, such states were Jammu and Kashmir (at 5 per cent level)and Punjab (at 5 per cent level) for total area and Jammu and Kashmir (at 5 per cent level), Himachal Pradesh (at 5 per cent level), Punjab (at 5 per cent level) and Haryana (at 5 per cent level) for rural area model.

(Tables, 17 -21).

## Proportion of Area Sown More Than Once:

The hypothesis that there is a positive correlation between proportion of area sown more than once and workforce participation rate, by and large, did hold good in Punjab and Haryana. The correlation was significant in Punjab (at 5 per cent level) for rural area model in 1971. However, in Himachal Pradesh and Rajasthan it exhibited a negative correlation and was significant (at 5 per cent level) in case of Himachal Pradesh.

(Tables, 17-21).

## Female Workforce Participation Rate:

As per the hypothesis, the variation in female workforce participation rate affected the variation in total workforce participation. A significant positive correlation was exhibited between the two in the areas where FWPR was high, as the case is in Jammu and Kashmir, Himachal Pradesh, and Rajasthan. However, the very low WPR among females in Haryana and Punjab caused a decrease in TWPR.

(Tables, 17 -21)

## Regression Analysis:

The above discussion on zero-order correlation between workforce participation rate (total

Table-22

Regression Chart, Total and Rural N.W. India

| 1971 Total | No.of Distt. | Constant | % S.C. Population $x_1$ | % Urban Population $x_2$ | Dependency Ratio $x_3$ | Literacy Rate $x_4$ | Sex Ratio $x_5$ | FWPR $x_6$ | PSWPR $x_7$ | Irrig. area to net area sown. $x_8$ | % area sown more than once to net area sown. | $R^2$ | F | $R^{-2}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regression equation | 64 | Y=26.829 | -0.553** | 0.165 | 0.352* | 1.033** | -0.115** | 0.713** | | 0.594* | 0.66 | 0.526 | 7.638** | 0.457 |
| Total 1981 | | | | | | | | | | | | | | |
| Regression equation | 76 | Y=52.569 | -0.146 | -0.093 | -0.769** | 0.107 | 0.302* | 0.263* | | 0.217 | 0.012 | 0.584 | 11.788** | 0.535 |

| RURAL | No.of Distt. | Constant | % S.C. population $x_1$ | Dependency Ratio $x_2$ | Literacy Rate $x_3$ | Sex Ratio $x_4$ | FWPR $x_5$ | PSWPR $x_6$ | Irrig area to net area sown. $x_7$ | % area sown more than once to net area sown $x_8$ | $R^2$ | F | $R^{-2}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1971 Regression equation | 64 | Y=54.291 | -0.428 | -0.071 | 0.944** | -1.098 | 0.58 | 0.595** | 0.041 | | 0.49 | 7.702** | 0.426 |
| 1981 | | | | | | | | | | | | | |
| Regression equation | 76 | Y=116.378 | -0.323** | 0.015 | -0.502** | -0.135 | -0.13 | -0.635** | -0.242 | | 0.492 | 9.414** | 0.439 |

* Significant at 5% level. ** Significant at 1% level.

and rural, 1971 and 1981) and the explanatory variables considered, covers only one facet of the problem in hand. However, in a study of workforce participation rate, it is not enough to know which of the variables are positively or negatively correlated; one would also like to find out whether a set of variables can help in explaining the variations in the dependent variables viz. WPR. For this purpose the statistical technique of multiple regression analysis was applied. The approach followed in the present study was of filling a regression equation by taking all the explanatory variables together. In case, no significant result was achieved, the independent variable/s which was/ were thought to be insignificant was/were deleted one by one until a set of variables explaining the WPR significantly was arrived at.

## North-West India; Total:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971, Y = | -0.553** | 0.165 | 0.358* | 1.033** | -0.115** |

| $x_6$ | $x_7$ | $x_8$ |
|---|---|---|
| 0.713** | 0.594* | 0.66 |

Where F = 7.638** $R^{-2}$ = 0.457.

The above equation explains the variation in WPR for total area model in 1971 for the region as a whole. As it is clear from the equation that 46 per cent ($R^{-2}$= 0.457) of the variation in WPR is explained by all the eight variables taken together. However, the explanatory variables viz. proportion of scheduled caste population, literacy rate, sex-ratio and female workforce participation rate were significantly correlated at 1 per cent level whereas dependency ratio and proportion of main workers in primary sector were correlated at 5 per cent level with WPR. In 1981, the equation explained 53 per cent of the variation in WPR with all the variables considered, the equation came out as follows:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981 Y = | -0.146 | -0.093 | -0.769** | 0.107 | 0.302* |

| $x_6$ | $x_7$ | $x_8$ |
|---|---|---|
| 0.263* | 0.217 | 0.012 |

Where F = 11.788** $R^{-2}$ = 0.535.

As its obvious from the equation, a less number of variables explained the variation in WPR in 1981 and these were dependency ratio correlated at 1 per cent level, sex-ratio, and female workforce participation rate correlated at 5 per cent level.

North-West India; Rural:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971 Y = | -0.428 | 0.071 | 0.944** | -1.098 | 0.58 |

| $x_6$ | $x_7$ |
|---|---|
| 0.595** | 0.041 |

Where F = 7.702** $R^{-2}$ = 0.426.

According to the above equation 42 per cent of variation in WPR for rural area in 1971 was explained by two variables having a significant correlation at 1 per cent level. These were literacy rates and proportion of man workers in primary sector. The other variables considered for rural areas were insignificantly correlated to WPR. In 1981, 44 per cent of variation in WPR was explained as below:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981 Y = | -0.323** | 0.015 | -0.502** | -0.135 | -0.13 |

| $x_6$ | $x_7$ |
|---|---|
| -0.635** | -0.242 |

Where F = 9.414** $R^{-2}$ = 0.439

The independent variables as in the above equation, which exhibited a significant correlation (at 1 per cent level) were proportion of scheduled caste population, literacy rate and proportion of main workers in primary sector.

Jammu and Kashmir; Total :

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971, Y = | 0.094 | 0.030 | -0.066 | -0.406* | -0.175* |

| $x_6$ |
|---|
| 0.525 |

Where F = 113.415** $R^{-2}$= 0.986.

After deleting two variables viz.proportion of main workers in primary sector and proportion of irrigated area, the above equation explained 99 per cent of variation in WPR. Among explanatory variables literacy rate, sex-ratio (at 1 per cent level) and female work force participation rate (at 5 per cent level) were significantly correlated to WPR. However, in 1981 all the eight independent variables explained 80 per cent of variation in WPR and female workforce participation rate was significantly correlated (at 5 per cent level) to it, as shown in the equation below.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
|---|---|---|---|---|---|---|
| 1981, Y = | 0.123 | 0.119 | -0.170 | -0.531 | 0.978 | 0.459 |

| $x_7$ | $x_8$ |
|---|---|
| 0.083 | 0.014 |

Where F = 7.751* $R^{-2}$= 0.806.

Table-23

Regression Chart, Total 1971-81.

| Jammu & Kashmir 1971 | No. of Dist. | Constant | % S.C. Population $x_1$ | % Urban Population $x_2$ | Dependency Ratio $x_3$ | Literacy Rate $x_4$ | Sex Ratio $x_5$ | FWPR $x_6$ | MWPR $x_7$ | % Irrig. area to net area sown. $x_8$ | % area sown more than once to net area sown. $x_9$ | $R^2$ | F | $\bar{R}^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regresstion equation | 10 | Y=61.027 | 0.017 | -0.037 | -0.072 | -0.459 | -0.048 | 0.542 | -0.159 | -0.028 | N.A. | 0.993 | 20.268 | 0.944 |
| Regression equation | 10 | Y=55.431 | 0.094 | 0.030 | -0.066 | -0.406* | -0.175* | 0.525** | - | - | - | 0.995 | 113.415** | 0.986 |
| 1981 Total | | | | | | | | | | | | | | |
| Regression equation | 14 | Y=-39.55 | 0.123 | 0.119 | -0.170 | -0.531 | 0.978 | 0.459* | 0.083 | 0.014 | N.A. | 0.925 | 7.751* | 0.806 |
| Himachal Pradesh 1971 | 10 | Y=112.615 | 0.0768 | -0.135 | 0.039 | -0.625 | -0.491 | 0.605 | -0.369 | -0.089 | 0.051 | - | - | - |
| Regression equation | 10 | Y=103.404 | 1.287 | -1.531 | -0.997* | - | - | - | - | - | 0.233 | 0.94 | 12.903* | 0.860 |
| 1981 Regression equation | 12 | Y=26.353 | -0.325 | 0.496 | -0.13 | -0.122 | -0.346 | 0.466 | 0.113 | -0.042 | - | - | - | - |
| Regression equation | 12 | Y=-38.584 | -0.678 | 1.34 | -0.373 | -0.223 | 0.421 | - | 1.163* | 0.343* | -0.132 | 0.988 | 33.099** | 0.958 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1971 | | | | | | | | | | | | | |
| Punjab | | | | | | | | | | | | | |
| Regression equation | 11 | Y=120.875 | -0.085 | -0.154 | 0.208 | -0.944 | -0.49 | 0.124 | -0.021 | -0.15 | 0.983 | 14.927 | 0.917 |
| Regression equation | 11 | Y=155.28 | -0.199 | -0.241* | 0.176 | -1.174* | 1.263 | - | 0.019 | -0.206 | 0.957 | 9.58* | 0.857 |
| 1981 | | | | | | | | | | | | | |
| Regression equation | 12 | Y=45.544 | -0.06 | -0.159 | -0.12 | -0.038 | 1.299 | 0.054 | 0.026 | 0.018 | - | - | - |
| Regression equation | 12 | Y=47.354 | -0.029 | -0.172* | -0.20** | -0.014 | 1.951* | - | - | 0.039 | 0.942 | 13.740** | 0.874 |
| Haryana | | | | | | | | | | | | | |
| 1971 | | | | | | | | | | | | | |
| Regression equation | 7 | Y=-52.848 | 1.338 | 0.438 | -0.23 | -0.06 | 9.185 | -0.675 | 0.391 | 0.133 | - | - | - |
| Regression equation | 7 | Y=27.407 | 0.192** | - | 0.23** | - | - | - | - | - | 0.719 | 5.124 | 0.578 |
| 1981 | | | | | | | | | | | | | |
| Regression equation | 12 | Y=51.732 | 0.386 | 0.079 | 0.01 | -0.557 | 0.036 | 0.188 | -0.03 | -0.085 | 0.70 | 0.877 | -0.097 |
| Regression equation | 12 | Y=53.87 | 0.213 | 0.006 | -0.11 | -0.325* | 0.21 | - | - | - | 0.819 | 5.458* | 0.669 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rajasthan | | | | | | | | | | | | |
| 1971 | | | | | | | | | | | | |
| Regression equation | 26 | Y=37.413 | 0.15 | -0.163** | -0.227* | -0.028 | 0.482** | 0.109 | -0.005 | 0.026 | 0.944 | 36.187** | 0.918 |
| 1981 | | | | | | | | | | | | |
| Regression equation | 26 | Y=55.729 | 0.113 | -0.15** | -0.25** | -0.116* | 0.588** | 0.049 | -0.007 | 0.045 | 0.946 | 37.255* | 0.920 |

* Significant at 5% level.

** Significant at 1% level.

TABLE - 24

Regression Chart, Rural , 1971 - 81.

| Rural | No. of Dist. | Regression Constant | X1 Population | X2 Dependency Ratio | X3 Literacy Rate | X4 Sex Ratio | X5 | X6 | X7 Distance to nearest urban area | X8 Area of small area comm. | $R^2$ | F | $\bar{R}^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1971 | | | | | | | | | | | | | |
| Jammu & Kashmir | 10 | Y = 136.411 | 0.272 | -0.032 | 0.497 | -1.817 | 0.551 | 0.505 | 0.329 | N.A. | 0.727 | 0.761 | -0.227 |
| Regression equation | 10 | Y = 75.186 | - | -0.419** | - | - | - | - | - | - | 0.55 | 9.815* | 0.494 |
| 1981 | | | | | | | | | | | | | |
| Regression equation | 14 | Y = 38.926 | -0.034 | -0.088 | -0.148 | 0.101 | 0.488 | -0.100 | -0.016 | N.A. | - | - | - |
| Regression equation | 14 | Y = 29.643 | -0.009 | -0.106 | -0.154 | 0.129 | 0.423** | - | 0.006 | - | 0.969 | 37.434** | 0.943 |
| Himachal Pradesh | | | | | | | | | | | | | |
| 1971 | | | | | | | | | | | | | |
| Regression equation | 10 | Y= 86.18 | 0.062 | -0.288 | -0.41 | -0.042 | 0.533 | -0.285 | -0.057 | 0.095 | - | - | - |
| Regression equation | 10 | Y= 69.241 | 0.052 | -0.28 | -0.326 | -0.038 | 0.532 | -0.133 | - | 0.096 | 0.988 | 25.179* | 0.949 |
| Rx 1981 | | | | | | | | | | | | | |
| Regression equation | 12 | Y=46.606 | -0.08 | -0.111 | -0.073 | -0.241 | 0.44 | 0.244 | 0.053 | -0.02 | - | - | - |
| Regression equation | 12 | Y=60.473 | -0.046 | -0.079 | -0.114 | -0.285 | 0.519** | 0.059 | - | 0.009 | 0.997 | 242.253** | 0.993 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Punjab<br>1971 | | | | | | | | | | | | | | |
| Regression equation | 11 | Y=45.52 | -0.098 | -0.008 | -0.132 | 0.047 | -0.179 | 0.411 | 0.151 | 0.031 | 0.003 | - | - | - |
| Regression equation | 11 | Y=55.34 | -0.087 | -0.041 | -0.198** | -0.198** | - | - | - | - | - | 0.91 | 15.171** | 0.850 |
| 1981 | | | | | | | | | | | | | | |
| Regression equation | 12 | Y=61.359 | -0.032 | 0.043 | -0.068 | 0.016 | -0.42 | 0.643 | 0.12 | 0.025 | -0.175 | - | - | - |
| Regression equation | 12 | Y=51.481 | -0.005 | 0.154* | 0.006 | 0.105 | -0.511* | - | 0.236 | - | - | 0.932 | 11.484** | 0.851 |
| Haryana<br>1971 | | | | | | | | | | | | | | |
| Regression equation | 7 | Y=-26.535 | 3.249 | -1.058 | 0.136 | -0.5 | -0.066 | 6.594 | -1.658 | 0.17 | 0.262 | - | - | - |
| Regression equation | 7 | Y=-36.458 | -0.098 | 0.324 | 0.556* | - | - | - | - | - | 0.039 | 0.955 | 10.724 | 0.866 |
| 1981 | | | | | | | | | | | | | | |
| Regression equation | 12 | Y=-6.189 | -0.508 | 0.542 | -0.636 | -0.210 | 0.781 | 0.547 | 0.449 | -0.014 | 0.032 | 0.983 | -0.11 | -9.9 |
| Regression equation | 12 | Y=52.214 | 0.102 | -0.09* | -0.19* | -0.24* | 0.036 | 0.401** | - | - | - | 0.976 | 34.280** | 0.947 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rajasthan | | | | | | | | | | | | | |
| 1971 | | | | | | | | | | | | | |
| Regression equation | 26 | Y=38.95 | 0.114* | 0.049 | -0.224** | -0.0[illegible] | 0.005 | 0.42?** | 0.112 | 0.017 | 0.008 | 0.926 | 22.53?** | 0.885 |
| 1981 | | | | | | | | | | | | | |
| Regression equation | 26 | Y=28.363 | 0.053 | 0.11 | -0.181** | -0.08 | 0.047 | 0.4** | 0.185* | 0.030 | -0.018 | 0.918 | 20.051** | 0.872 |

* Significant at 5% level.

** Significant at 1% level.

Jammu and Kashmir; Rural:

$$x_2$$

1971, Y = -0.419**

Where F= 9.815* $R^{-2}$= 0.494

In rural areas all the variables except dependency ratio had to be deleted to get a significant correlation. This variable viz. dependency ratio explained 49 per cent of variation in WPR. In 1981, after deleting only one explanatory variable i.e. proportion of workers in primary sector, 94 per cent of variation in WPR was explained by a combination of the factors as shown in the equation that follows:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981, Y = | -0.009 | -0.106 | -0. 154 | 0.129 | 0.423** |

$$x_7$$

0.006

Where F = 37.434** $R^{-2}$ = 0.943.

As in the above equation, the proportion of female workforce participation was significantly correlated (at 1 per cent level) to WPR, the other variables being insignificantly correlated.

Himachal Pradesh; Total:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_9$ |
|---|---|---|---|---|---|
| 1971, Y= | 1.287 | -1.531 | -0.997 | 0.373 | 0.233 |

Where F = 12.903* $R^{-2}$= 0.860.

In 1971, after deleting four variables 86 per cent of variation was expalined by the above equation. Among the explanatory variables in the equation only dependency ratio was significantly correlated (at 5 per cent level) to variation in WPR. In 1981,after deleting just one variable which was proportion of female workers, 95 per cent of the variation in WPR was explained by the following equation.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981, Y = | -0.678 | 1.34 | -0.373 | -0.223 | 0.421 |

| $x_7$ | $x_8$ | $x_9$ |
|---|---|---|
| 1.163* | 0.343* | -0.132 |

Where F = 33.099** $R^{-2}$ = 0.956.

As in the above equation just two variables viz. proportion of workers in primary sector and proportion of irrigated area, were significantly correlated (at 5 per cent level) to variation in WPR.

Himachal Pradesh; Rural:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971,Y = | 0.052 | -0.28 | -0.326 | -0.038 | 0.532 |

| $x_6$ | $x_8$ |
|---|---|
| -0.133 | 0.096 |

Where F = 25.129* $R^{-2}$ = 0.949

After deleting one variable viz.proportion of irrigated area, 94 per cent of variation in WPR was explained by above equation. However, none of the variables in the equation was significantly correlated to variation in WPR . In 1981, 99 per cent of the variation in WPR was explained by the following equation.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981,Y = | -0.046 | -0.079 | -0.114 | -0.285 | 0.519** |

| $x_6$ | $x_8$ |
|---|---|
| 0.059 | 0.009 |

F = 242.253** $R^{-2}$ = 0.993.

Only one variable viz.female workforce participation rate exhibited significant correlation (at 1 per cent level) with variation in WPR.

Punjab; Total:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ |
|---|---|---|---|---|
| 1971, Y = | -0.087 | 0.041 | -0.198** | -0.188** |

Where F = 15.171** $R^{-2}$ = 0.850.

As shown in the above equation, 85 per cent of variation in WPR in Punjab (total, 1971) was correlated to four variables viz. proportion of Scheduled caste population, degree of urbanisation, dependency ratio and literacy rate. Among these, dependency ratio and literacy rate were significantly correlated (at 1 per cent level) to variation in WPR. In 1981, three variables were deleted and 85 per cent of variation in WPR was explained as shown in the following equation.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_7$ |
|---|---|---|---|---|---|---|
| 1981,Y= | -0.005 | 0.154* | 0.006 | 0.105 | -0.511* | 0.236 |

Where F = 11.484* $R^{-2}$ = 0.851.

The two variables viz. degree of urbanisation and sex-ratio were significantly correlated (at 5 per cent level) to WPR in Punjab.

Punjab; Rural:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971, Y = | -0.199 | -0.241* | 0.176 | -1.074* | 1.863 |

| $x_7$ | $x_8$ |
|---|---|
| 0.019 | -0.206 |

Where F = 9.58* $R^{-2}$ = 0.857.

The above equation explained 85 per cent of variation in WPR and two variables viz. dependency ratio and sex-ratio were significantly correlated (at 5 per cent level) to variations in WPR. In 1981, 87 per cent of variation was explained by the equation that follows:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_8$ |
|---|---|---|---|---|---|---|
| 1981, Y = | -0.029 | -0.172* | -0,20** | -0.014 | 1.951* | 0.039 |

Where F = 13.740** $R^{-2}$ = 0.874.

In the above case two variables viz. dependency ratio and proportion of female workers were correlated at 5 per cent level and literacy rate was significantly correlated (at 1 per cent level) with variation in WPR.

Haryana; Total:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
|---|---|---|---|---|---|---|
| 1981, Y= | 0.102 | -0.09* | -0.19 | -0.24* | 0.036 | 0.401 |

Where F = 34.280** $R^{-2}$ =0.947.

In 1971, the number of observations being less (7 districts) the variation in WPR could not be

explained getting a significant F value. However, in 1981, 94 per cent of variation in WPR was explained by the above equation and two variables viz. degree of urbanization and literacy rate were significantly correlated to WPR at 5 per cent level.

Haryana; Rural:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981, Y = | 0.213 | 0.006 | -0.11 | -0.325* | 0.22 |

Where F = 5.458* $R^{-2}$ = 0.669.

In 1981, 66 per cent of variation in WPR was explained by the above equation and the explanatory variable viz. sex-ratio was significant correlation to variation in WPR at 5 per cent level.

Rajasthan; Total:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1971, Y = | 0.114* | 0.049 | -0.224** | -0.089 | 0.005 |

| $x_6$ | $x_7$ | $x_8$ | $x_9$ |
|---|---|---|---|
| 0.423** | 0.112 | 0.017 | 0.008 |

Where F = 22.533** $R^{-2}$= 0.885

With all the variables considered, the above equation explained 88 per cent of variation in WPR. Proportion of scheduled caste population and proportion of female workers were positively

correlated to WPR at 5 per cent level and 1 per cent level respectively. Dependency ratio was negatively correlated to WPR at 1 per cent level. In 1981, the variables in the equation below in a combination explained 87 per cent of variation in WPR.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ |
|---|---|---|---|---|---|
| 1981, Y= | 0.053 | 0.11 | -0.181** | -0.08 | 0.047 |

| $x_6$ | $x_7$ | $x_8$ | $x_9$ |
|---|---|---|---|
| 0.4** | 0.185* | 0.030 | -0.018 |

Where F = 20.051** $R^{-2}$ = 0.872.

While proportion of female workers and proportion of workers in primary sector were positively correlated at 1 per cent and 5 per cent level respectively, dependency ratio was negatively correlated (at 1 per cent level) to WPR in Rajasthan, 1981.

Rajasthan; Rural:

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ |
|---|---|---|---|---|
| 1971, Y= | 0.15 | -0.163** | -0.227* | -0.028 |

| $x_5$ | $x_6$ | $x_7$ | $x_8$ |
|---|---|---|---|
| 0.482** | 0.109 | -0.005 | 0.026 |

Where F = 36.187** $R^{-2}$ = 0.918

With all the variables considered, the above equation explained 91 per cent of variation in WPR. Dependency ratio and literacy rate were

negatively correlated to WPR at 1 per cent and 5 per cent level respectively, whereas proportion of female worker was positively correlated at 1 per cent level to WPR. In 1981, 92 per cent of the variation was explained by the following equation.

| | $x_1$ | $x_2$ | $x_3$ | $x_4$ |
|---|---|---|---|---|
| 1981, Y = | 0.113 | -0.15** | -0.25** | -0.116* |
| | $x_5$ | $x_6$ | $x_7$ | $x_8$ |
| | 0.588** | 0.049 | -0.007 | 0.045 |

Where F = 37.255** $R^{-2}$ = 0.920

Dependency ratio, literacy rate and sex-ratio were negatively correlated to WPR at 1 per cent and 5 per cent level respectively, whereas, proportion of female workers was positively correlated (at 1 per cent level) with variation in WPR.

# CHAPTER - VI

## SUMMARY AND CONCLUSIONS

One-third (33 per cent) of India's total population constituted the workforce in 1971 and 1981 censuses. Although this proportion of workers included child workers, who are legally not permitted to work[1], and people above 60 years, yet the proportion of workers to population was low and typical of developing countries passing through the second-stage of demographic cycle with a large proportion of population in non-working age-groups.

The North-West India was no exception to the phenomenon of low proportion of workers to population. A little below one-third (30 per cent) of its total population constituted the labour force. Proportion of rural population in workforce

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1. *Ministry of Law (1960): Employment of Children Act, 1938 (as amended up to 15th Sept,1951), The Manager of Publications, Government of India, New Delhi.*

(30.6 per cent) was higher than that in urban population (28 per cent). The above statement holds good in all the states in north-west India except Haryana and Punjab. Reasons for higher participation rate in work in rural areas were probably the great labour absorbing capacity of agriculture, few taboos against female participation in work and their preference for various agricultural operations, low literacy rate etc. In urban areas, longer schooling period; implying high literacy rate, delaying entry into workforce kept the proportion of workers lower as compared to that of rural.

The higher proportion of workers in urban areas in Haryana and Punjab was mainly because of tendency towards retaining children in school, differential in age-structure of rural-urban population, urban being favourable to working age-groups.

In 1981, male workforce participation rate (50.6 per cent) was far higher as compared to that for females (7.2 per cent). The resultant male-female disparity was extremely large in North-West India. It was highest in Punjab where female workforce participation rate was lowest in the region

(2.3 per cent). Himachal Pradesh exhibited highest female workforce participation rate (18.7 per cent). Areas of high proportion of working females were probably those where (i) females were allowed greater mobility, (ii) they were compelled by economic exigencies to take part in work and (iii) suitable work opportunities were available for them. On the other hand, low proportion of female workers was probably due to strong taboos against female participation in work. The chief cause responsible for high male workforce participation rate was probably the expectation from a male to be family bread winner. Workforce in India is thus almost synonymous with male workforce with only marginal role for females in work.

As for the sectoral distribution of workforce, primary sector engaged a bulk of main workers in three sectors viz. primary, secondary and tertiary. The prop was 70.3 per cent, 13.4 per cent and 16.3 per cent respectively in 1981 census. Further, primary sector was, by and large, the main sector of the rural economy, whereas the other two sectors viz. secondary and tertiary, were the main sectors of urban economy.

It would, however, be wrong to say that primary sector was missing in urban areas and there was no workforce participation in secondary and tertiary sectors in rural areas. In 1981, the proportion of females in primary sector was higher than their male counterpart in north-west India. However, this phenomenon did not hold good in case of Punjab. In secondary and tertiary sectors, the proportion of females was lower than that of males in north-west India except Punjab, where it was higher than males. The causes of such trends were probably the nature of chores in agricultural sector. Their operation require no special skill and are best suited to females. The agricultural operations like plantation, plucking etc. are mainly done by females. Further, in rural sector, females can carry their infants to the place of their work and hence their rearing up does not become a hindrance while working. In contrast, the other two sectors viz. secondary and tertiary require some kind of skill and/or training and the operations are supposed to be best suited to males in preference to females. As for the sectoral-shift, reflected through shift in labour force in different sectors, the whole north-west India except few areas in south-eastern Himachal Pradesh and southern Rajasthan, exhibited a decline

in primary sector and increase in secondary and tertiary sectors over the decade 1971-81.

The spatial distribution of workforce participation rate (WPR) in North-West India revealed that most of the areas lying in the south-western parts of the sub-region, namely Rajasthan Desert and Uplands, had high proportion of workers. Another such area comprised most of the districts in north-eastern parts of the sub-region called western Himalaya. In Punjab-Haryana plain quite a few districts lying in the central and south-western parts of the sub-region had high WPRs. On the other hand, a low proportion of workers was exhibited by most districts of the Punjab-Haryana plain sub-region. These included north-north-east of Punjab and northern, central and south-western parts of Haryana. Such areas in Rajasthan desert and uplands comprised the districts in the north-west, north and north-east of the state. The western and south-western parts of the west-Himalayan sub-region also exhibited a low proportion of workers to total population.

So, it is obvious from the pattern of WPR in the region that most of the districts of the mountainous tract comprising West Himalayan sub-

region had high proportion of workers. Further the districts in Thar desert of Rajasthan and along the Aravali range exhibited somewhat, high WPR. In contrast the land of rich fertile alluvium comprising Punjab and Haryana had low WPR. It is due to the effect of the physical environment of the areas that some of the districts exhibited high WPR whereas others had low WPR. The mountainous tract of Jammu and Kashmir, Himachal Pradesh and parched areas of Rajasthan make it hard to earn a livelihood. So in order to sustain the family, maximum number of people have to work, including women and children who are otherwise excluded. But the alluvial plain of Haryana and Punjab offer a substantial area for agricultural pursuits and just few members of the family can raise a livelihood, causing extremely low WPRs among females and children.

Statistically, the high proportion of workers was related to proportion of female workers, proportion of area irrigated and proportion of workers in primary sector. The low proportion of workers was related to degree of urbanisation, literacy rate, sex-ratio and dependency ratio. The correlation and regression results showed that some more variables like level of income, proportion of scheduled tribe population, proportion of Muslims, Jats, Rajputs and Brahmins, level of industrial

development, cropping pattern etc. could have been considered for a better analysis of spatial pattern of WPR. Further, some kind of spuriousness was reflected in regression analysis, since in some cases just few variables explained above 90 per cent of variation in WPR. It was probably due to choice of a wrong variable viz. female WPR which is actually a part of total WPR. Further, different approach could have been adopted while fitting the regression equation. One plausible alternative could be that to determine the relationship between the dependent variable and the explanatory variables, stepwise regression technique could have been used. This could be done by picking up the explanatory variable which had highest correlation (known through zero-order correlation) with the dependent variable and fit a regression equation. Next, the other explanatory variable independent of the first variable but explaining the next higher variation in the dependent variable, could have been included while fitting the regression equation and so on, until addition of an extra variable was of significant importance. However, the zero-order correlation and regression analysis discussed in the previous chapter did bring out significant results while explaining the

variation in WPR with reference to the independent variables considered.

As it follows from the tables dealing with multiple regression, the negative impact of dependency ratio in the region over the decade 1971-81 had increased. This reflects upon withdrawl of children in non-working age-groups from workforce and resultant increase in dependency ratio. As the process of economic development takes place, in rural areas, in particular, people get better opportunities to educate their children otherwise engaged in work. The negative correlation of literacy rates also showed a declining trend. In the initial stages, the more illiterate population is exhibited. When they go in for education, reduce the WPR. But at later stages, more population is literate and finds jobs in various sectors showing a 'U' curve pattern. The negative impact of sex-ratio showed a declining trend over the decade 1971-81. This implies that as the development processes take place, more females join workforce due to lessened taboos against females to take part in work outside home. Further, the positive impact of irrigated area on WPR showed stronger correlation. As the development in agricultural sector takes place, the methods and processes get advanced and more and more area is acquired for

cultivation and area sown more than once increases.

In nut shell, the study does reflect upon some of the important explanatory variables of WPR in the region and the multiple regression results does point out the trend that may be exhibited in future. This aspect is discussed in the preceding paragraph, that the negative impact of sex-ratio and literacy rate is lessened as the economic development takes place and that of dependency ratio increases. The agricultural variables like proportion of irrigated area also show stronger positive impact resulting from various developments in rural economy.

However, in Chapter IV, it was pointed out that the most developed countries of the world experienced a shift away from primary sector in favour of secondary and tertiary sectors where the productivity is more and such a trend reflects upon the level of economic development. The same phenomenon is exhibited in number of districts in the region. It is to be noted here that as the investments are made in the agricultural sector the productivity starts rising. But the trend of shift away from primary sector persists. In case of India, return of the investments made in both agricultural and non-agricultural sectors, as they contribute to the

national product, the level of employment and their workforce absorbing capacity, socio-economic factors of rural to urban migration and the demographic trends in rural and urban areas constitute an important aspect to study the pattern of sectoral-shift.

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