Trans. Inst. Indian Geographers
Vol. 29, No. 2, 2007

Functional Pattern of Towns in Rajasthan

R.N. Mishra and Pawan Kumar Sharma

Abstract

Based on the Census data of 2001 the paper tries to classify the 222 urban centres of Rajasthan. The classification was done with the help of the Functional Specialization Index used by J. W. Webb (1959) and modified by Sinha (1976). This method was considered more suitable in the sense that it takes into account the local and regional significance of the towns. Individual results for all the seven functional categories showed great variations in the dominant function and in their regional distribution. Few centres were specialized in one particular function while others did not show the same specialization. In order to know the cumulative result on the basis of all seven functions for each urban centre, the Composite Index method has been used. In this method percentage values of all seven categories for all 222 towns of Rajasthan have been standardized in order to make them comparable. The towns are then classified according to four levels of functional specialization ranging from specialized to very highly specialized.

Introduction

Functions are the driving force of city life and influence to a very large extent its growth and morphology. Functional classification of urban centres provide the basis for the regional development planning as they are the growth foci in transmitting development in the entire region. The services performed by the service centres are not always in the same proportion and hence, centres differ in their functions. With the knowledge of their predominant function they can be labelled and described accordingly.

A number of studies have been conducted regarding the functional pattern of towns by geographers, social scientists and planners, using various methodologies which can be broadly grouped into two categories:

1. Empirical studies (Qualitative Method)
2. Mathematical studies (Quantitative Method)

In the present study Functional Specialization Index Method (Quantitative Method) has been applied to decide the functional pattern of towns in Rajasthan. It is a more suitable method in the sense that it takes into account the local and regional significance of the towns and thus is a very effective measure. Finally on the basis of Composite Index Method the level of specialization of urban centres have been worked out.

Study Area

Rajasthan, the largest state of India, is having an area of 3,42,239 sq. km with a

population of 56.5 millions as per 2001 Census. Its geographical location is between 23°13' N to 30°12' N latitude and 69°30' E to 78°17' E longitude with the Tropic of Cancer passing through the southernmost tip of the state. Physiographically the land of Rajasthan comprises of lofty hills and shifting sand dunes, scorching heat and freezing cold nights, fertile plains, rugged ravines. The Aravalli ranges form a dividing line between the arid land in the western part and the plain in the eastern part; the central part is dominated by the Aravalli mountain system. The eastern part is known as Hadoti region and comprises of Malwa Plateau. As per 2001 Census, there are two hundred and twenty-two urban centres in Rajasthan (Fig.1), which cover 23 percent of the total population of Rajasthan. The western desert region has fewer urban centres while the eastern part has the highest number of urban centres, due to favourable geographical conditions.

Methodology

In empirical studies, Aurousseous (1921) classified the cities into six categories. Makenzie (1925), a sociologist, classified the service centres into four categories. Hall (1934) relates the functions as the major factor in the growth of service centres. James and Nath (1954) identified the service centres on the basis of important economic functions.

During the recent period, quantitative and statistical methods are widely used by urban scholars for functional classification of cities. Harris (1943), Nelson (1955), Berry and Garrison (1958), Rafiullah (1965) and Mitra (1967) contributed substantially in the development of an appropriate methodology. Nelson and Harris method is one of the most widely used techniques for functional classification of cities. It can be worked out from mean and standard deviation of the occupational structure of the given cities, and cities are classified into various specialized groups on the basis of mean + Sd., mean + 2Sd and mean + 3Sd. However, in this method the local and regional significance of service centres has been completely neglected. To avoid this complication Functional Specialization Index Method has been used in the present study. J.W. Webb (1959) first used this method in the analysis of small urban centres of Minnesota. It is a more suitable method in the sense that it takes into account the local and regional significance of the towns. Thus the figures are more rationalized, the local as well as regional significance is fully considered, and the abnormally shooting high values of every town are reduced. Sinha (1976) in his study of Chhota Nagpur Plateau used the modified formula of the functional index. The same method with some modification has been used in the present study.

$$F.I. \sqrt{\frac{Nw \times 100}{TW} x \frac{Pw \times 100}{TN}}$$

where

F.I. = Functional index

Nw = Number of workers in a particular function of a town

TW = Total workers in that particular function of the region

Pw = Number of workers in the town

TN = Number of workers in the region

Functional Index values of each functional category for all 222 urban centres have been calculated.

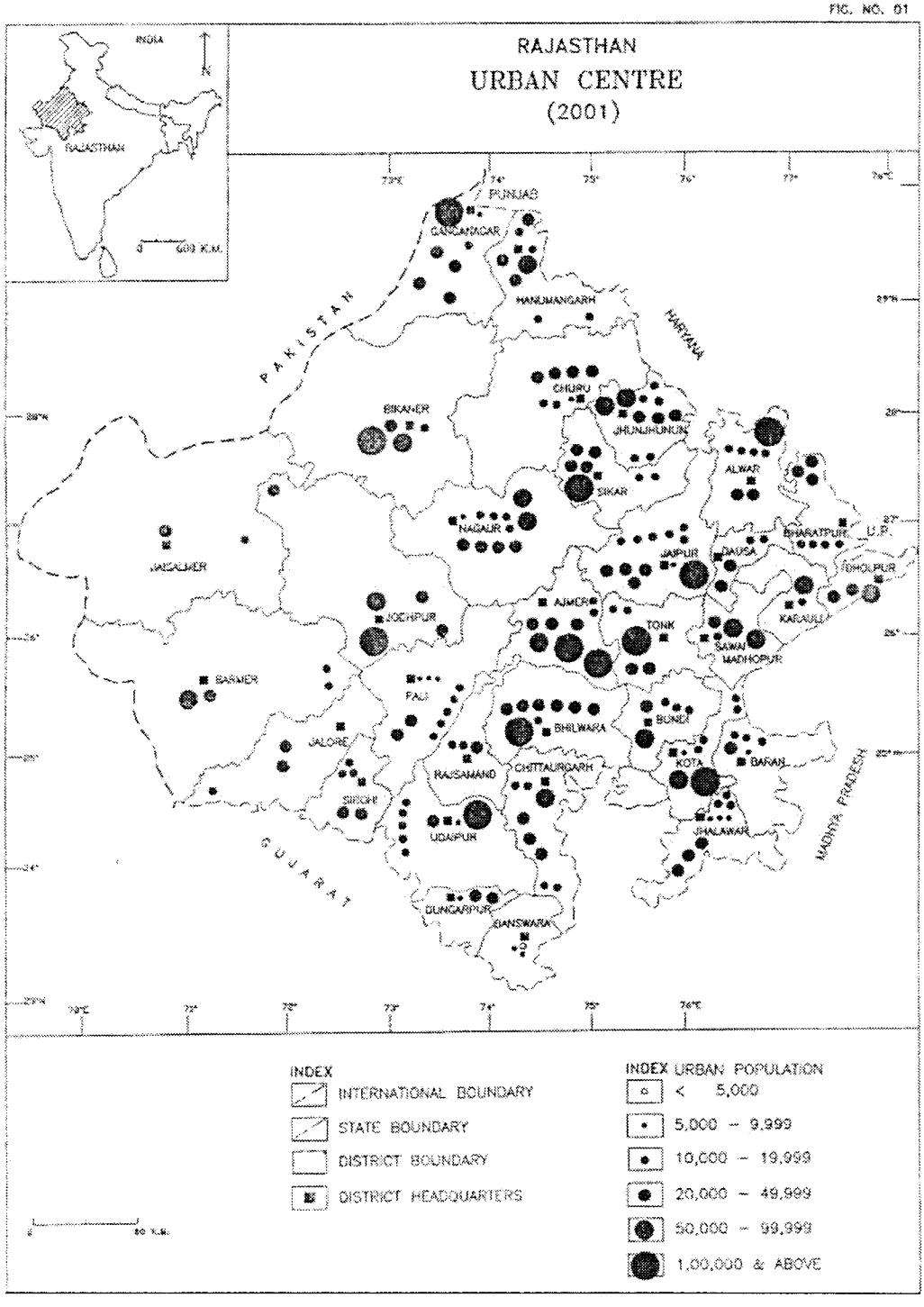

Fig. 1: **Urban Centres**

Table 1: **Functional Classification of Towns in Rajasthan**

Number of Towns

Functional Index Categories	Mining and Quarrying	House-hold Ind.	Manu-facturing Ind.	Cons. truc-tion	Trade Comm-erce	Tran. Storage	Oth-ers	Level of specia-lization
Mean to Mean + Sd	30	29	22	26	185	24	20	Less specialized
Mean + Sd to mean + 2 Sd	03	05	04	04	05	03	03	Medium specialized
Mean + 2 Sd to Mean + 3 Sd	02	02	03	01	03	03	03	Highly specialized
More than mean + 3 Sd	03	02	03	04	03	03	03	Very highly specialized
Total	**38**	**38**	**32**	**35**	**196**	**33**	**29**	

In the present study cultivators, agricultural labourers and fishing, hunting and allied activities have been omitted because these are primary activities, and thus do not come under essential function of towns. Towns mainly perform secondary and tertiary activities. Further in order to bring uniformity in measuring scale, mean and standard deviation of all these values have been calculated and various scales have been determined such as mean + Sd, mean + 2Sd and mean + 3Sd. Towns are classified for each of the seven occupational categories on the basis of Functional Index Value (Table1).

The Fig. 2 and 3 show that Jaipur, Jodhpur and Kota show specialization in maximum functional categories with values of more than mean + 3 Sd. An attempt has been made to group the towns under various functional categories.

1. Mining and Quarrying

Rajasthan is a museum of mineral resources in India. The most important centres giving a value more than mean + 3 Sd are Ranganj Mandi, Makrana and Rajsamand, which are highly specialized in limestone and marble quarrying. Khetri is important in copper and Udaipur is specialized in limestone and mica mining. Other important urban centres with medium to less specialization in mining and quarrying are Karauli, Bhilwara, Chittorgarh, Jalore, Kankroli and Suket.

2. Household Industrial Centres

Jaipur and Jodhpur are very highly specialized in household industry while Ajmer and Bikaner are highly specialized. These centres have specialization in cotton, textiles, handicrafts, gem, pottery making, marble and woodcarving. Five centres are placed in the medium specialized category while 29 towns are classified as less specialized centres.

3. Manufacturing Industry

Jaipur, Jodhpur and Kota show very high specialization in the manufacturing industry with a functional index of more than mean + 3 Sd. These centres have a better source of

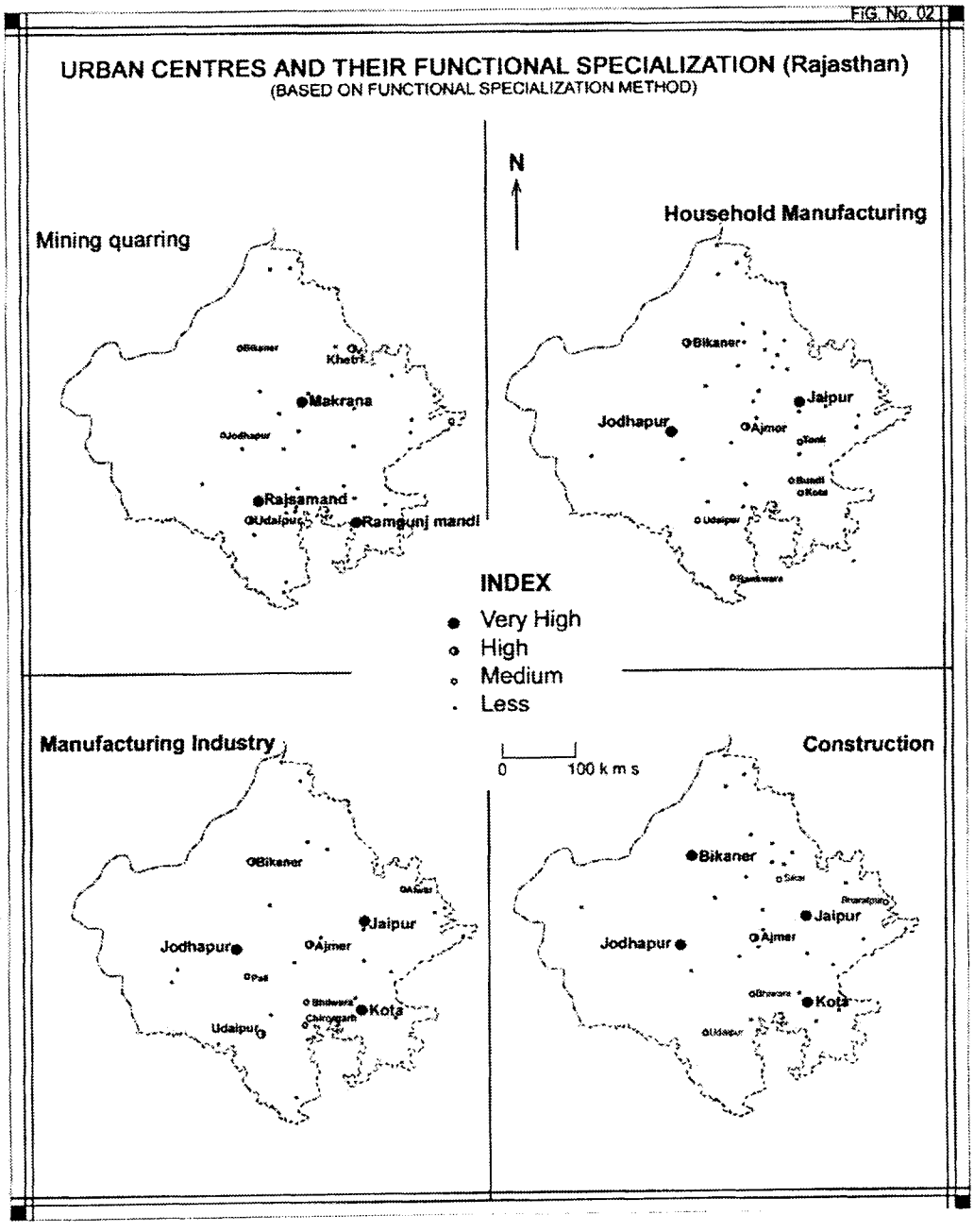

Fig. 2: **Functional Specialization of Urban Centres**

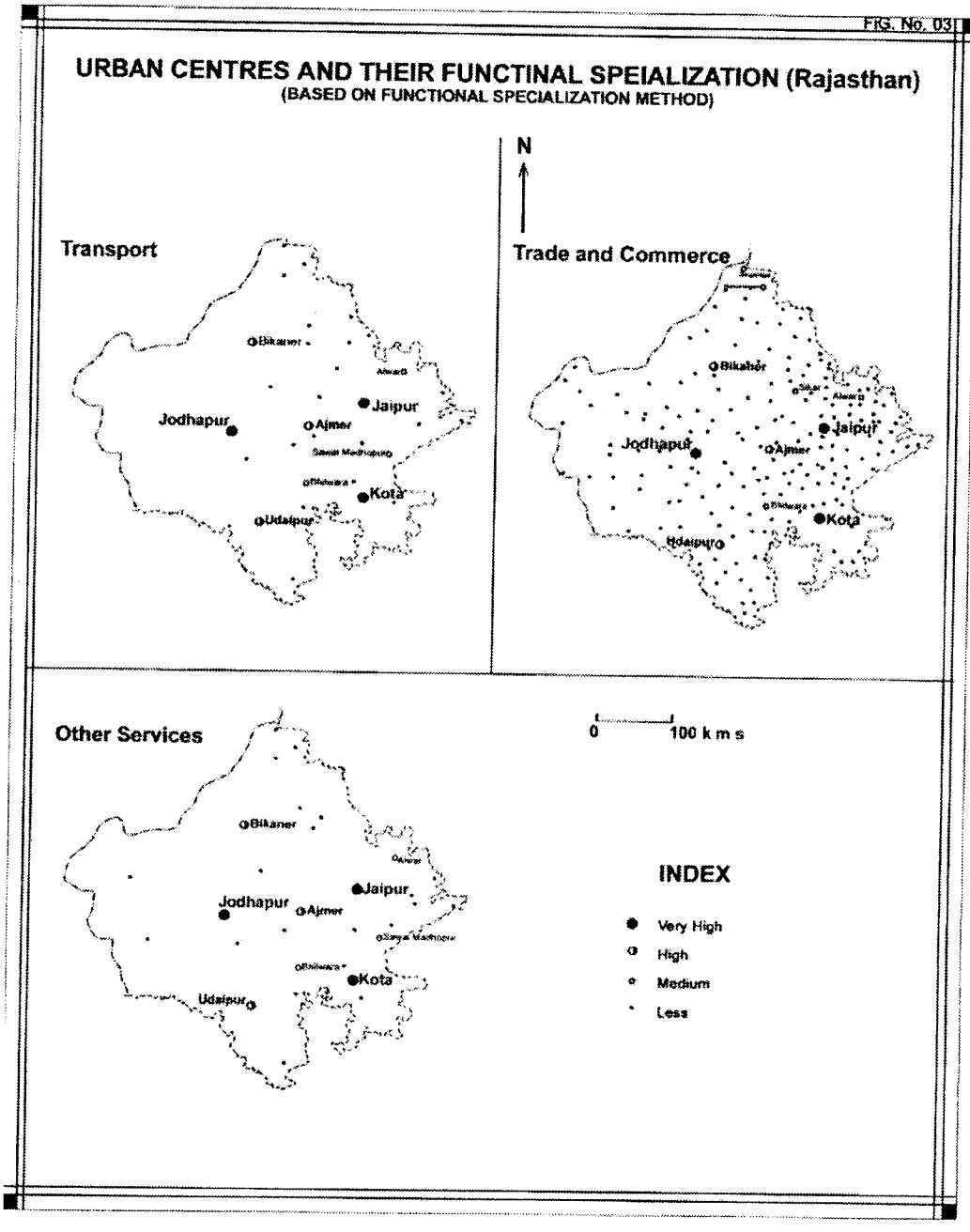

Fig. 3: **Functional Specialization of Urban Centres**

financial assistance, power supply and transport network. Bikaner, Ajmer and Udaipur are also highly specialized in manufacturing. Other centres like Alwar, Bhilwara, Pali and Chittorgarh are having medium specialization. 22 urban centres are ranked under less specialized.

4. Construction

Construction activities are carried out in all the towns. Bikaner, Jaipur, Jodhpur and Kota are very highly specialized in construction. Ajmer shows high specialization while Bharatpur, Sikar, Bhilwara and Udaipur fall under medium specialization. Availability of raw material for construction e.g. building stone is easily available in these centres. The urban centres like Alwar, Banswara, Bundi, Churu, Fatehpur, Beawar, Jaisalmer, Karauli etc. have less specialization in construction.

5. Trade and Commerce

Trade and commerce is the most important function of a town, carried out in all the urban centres. However, Jaipur, Jodhpur and Kota are very highly specialized in trade and commerce because they have all the basic infrastructural facilities required for good trade. Ajmer, Bikaner and Udaipur are also highly specialized. The important commodities of trade are handicraft goods, gems and ornaments, diamonds, marbles and marble idols, tie and dye clothes. The maximum number of urban centres, namely 196 towns, shows a certain degree of specialization in trade and transport.

6. Transport, Storage and Communication

Jaipur, Jodhpur and Kota have well developed road, railway and air transportation. Ajmer, Bikaner and Udaipur are having high specialization in transport, storage and communication. There are 27 other centres with medium to less specialization in this function.

7. Other Services

Jaipur, Jodhpur and Kota with a value of more than mean +3Sd are categorised as very highly specialized in other services. Services are dominant in administrative headquarters, especially district headquarter. There are 23 urban centres having medium to less specialization in other services.

Level of Functional Specialization

The methodology used above shows the individual results for all the seven functional categories. Few centres are specialized in one particular function while in others the same specialization is not found. In order to know the cumulative result on the basis of all seven functions for each urban centre, the Composite Index method has been used. In this method percentage values of all seven categories for all 222 towns of Rajasthan have been standardized in order to make them comparable. The standardized value has been found out with the help of the following formula.

$$S.V. = \frac{x_i \quad \bar{x}}{\sigma}$$

where

S.V. = Standardized Value

x_i = Individual percentage value of a particular function in a town

$\bar{x}$ = Mean of that particular functional group

σ = Standard deviation of that particular functional group.

Table 2: **Level of Functional Specialization**

Composite index value	No. of towns	Level of specialization
Above + 0.20	03	Very highly specialized
00 to 0.20	03	Highly specialized
- 0.20 to 00	16	Medium specialized
Below - 0.20	82	Less specialized
TOTAL	**104**	
Towns having no specialization	118	No specialization

Finally, the Composite Index has been calculated, and urban centres are categorized accordingly.

On the basis of the above table towns of Rajasthan can be grouped into following the four functional level of specialization (Fig. 4).

1. Very Highly Specialized

Jaipur, Jodhpur and Kota have very high specialization in all six categories i.e. household industry, manufacturing industry, construction, trade and commerce, transport and storage, and other services. Large scale manufacturing units, cotton cloth making, embroidery work, pottery making, marble carving, wood carving, carpet and mat making and leather craft etc. are very famous in these centres.

Masuria sarees of Kota with their beautiful zari border, the pagree and pech of Jaipur, tie and dye sarees of Jodhpur are very well known. Woollen clothes of Jodhpur are also very famous. These centres are highly specialized in manufacturing industry.

Jaipur, the capital of the state, has a favourable industrial climate and offers good economic facilities like industrial estates and areas, transport and communication, power, finance etc. Jaipur possesses the factor of accessibility, modality and frequency in all types of transport network. Being the capital of the state it is the focal point of attraction for industrialists all over the country and a number of industrial areas have been developed. There are industrial training institutes in Jaipur providing training facilities in trade like black smithy, carpentry, machinist, moulding, welding, painting, plumbing and electrical fitting etc.

Jodhpur has been progressing towards industrialization after the formation of Rajasthan because of its regional location in the western arid land. It is one of the biggest rail and road junctions in the state. Jodhpur is rich in livestock wealth because of huge quantity of cattle, sheep, and goats; there is a good scope for the woollen and leather industries. Building stone is the most important mineral of Jodhpur.

Chambal valley project has created a new industrial climate in Kota. It is the only city of India where three types of power generating plants namely hydel, thermal and atomic power are installed. Many commercial crops like sugarcane, linseed, groundnut etc. are utilized for industrial purposes. Kota

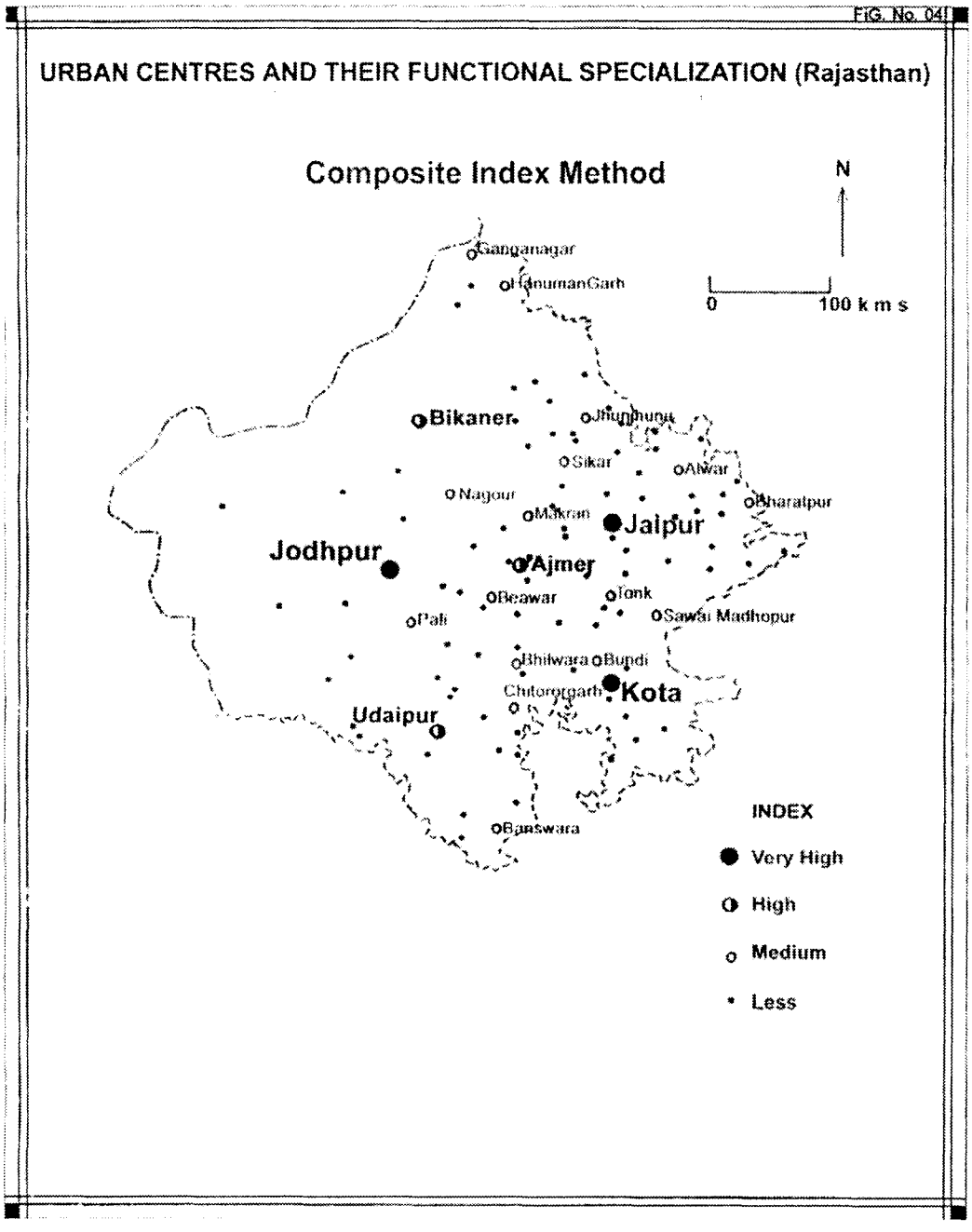

Fig. 4: **Functional Specialization of Urban Centres**

Instrumentation, fibre, stone, household, engineering, food processing etc. are the main industries of the area. These centres are also specialized in other services. In the state capital Jaipur, the maximum number of other workers engaged in government and semi-government jobs, employed in institutions etc. are found. Jodhpur has also its importance in other services mainly in administration, education and defence. Kota is now becoming one of the leading centres in the country in the field of educational institutions.

2. Highly Specialized

Bikaner, Ajmer and Udaipur have been included in this category. They are also regional centres. Bikaner is famous for its woollen products, namkeens, papads, dairy farming and milk distribution. Bikaneri rasgullas and namkeens have created their own demand and these items are even exported. With coming of IGNP it has now developed as Mandi and agro-industrial centre.

Ajmer has been a centre of attraction for people all over the world due to its mythological, historical and religious importance. It is a centre of composite culture and place of pilgrimage for Hindus as well as Muslims due to the existence of the sacred Pushkar Tirtha and Dargah Sharif.

Udaipur is famous for its forest resources mainly for timber, khair, salar wood, khirmi for toys and bamboo. Minerals like soapstone, zinc, lead, iron ore, asbestos, marble etc are important. The city is known as the city of lakes. Tourists from different parts of the countries come here. The city has a good network of roads. Udaipur Zinc Smelter is an Indian Government enterprise where zinc is obtained through Jawar Mines. Some other industries are also found here.

3. Medium Specialized

Sixteen urban centres have been included in these categories. Ganganagar and Hanumangarh are very important for agro-based industries. It has cotton textile, sugar, rice, husking and oil mills, and animal food units. These centres provide better opportunities of employment to the people in the region; which is rich in agricultural production due to IGNP. The network of rail and road transport is nicely developed and provides good facilities for the movements of goods and people. Alwar is a sub-regional centre under the National Capital Plan. It is endowed with a number of important minerals like barites, copper ore, building stones, asbestos, china clay, feldspar etc. Alwar with its sound infrastructure and alluring incentives of the state government is providing good opportunities for entrepreneurs. The centre is well developed in social amenities like education, technical institutions, medical facilities etc. Alwar is also important in agro-based and forest resource based industries. Bhilwara, employing 26.3 percent industrial workers, has become an industrial node with two cotton textile mills, one vanaspati manufacturing unit and a number of saw mills, dal mills and other factories. Important woollen industry is found in Tonk, which produces wool of fine medium to coarse varieties. Tonk is also important for leather tanneries. It has good irrigation facility. Tonk is also famous for its medieval heritage sites. Makrana has an important place in marble production. Other centres show specialization in trade and transport, household and manufacturing industries.

4. Less Specialized

Eighty-two urban centres have been included in this category. The majority of the

population of Rajasthan state depend upon agriculture. Wheat, oil seeds, sugarcane, cotton, pulses, gram, groundnut etc. are such crops on which some industries have been established. Oil mills have been established in Baran, Bharatpur, Dholpur, Pali and Jhalawar. Rajasthan has been called a veritable museum of minerals. It produces about 85% gypsum, 82% soapstone, 76% silver, 67% asbestos, 61% feldspar and 28% mica of the total production of India. Yet Rajasthan receives a very meagre income. For mineral based industries Chittorgarh, Sambhar, Bundi, Sawai Madhopur, Sikar, Sirohi, Chomu are better centres for industrial development. Jhunjhunu, Churu, Chittorgarh are important centres of woollen textiles. Jaisalmer, Govindgarh, Chomu and Balotra, Kishangarh are main centres where cotton and woollen clothing are manufactured. Glass industry is most important in the Dholpur area.

Rajasthan is an agricultural state; therefore most of the trade is related to agriculture and its allied commodities. The trade and commerce of Rajasthan is not only limited to states of India but is fast developing the export of a number of commodities to foreign countries. Gems and ornaments are the main items of exports. Every year gems, diamonds and other precious stones worth Rs. 470 million are exported. Handicrafts, marbles and marble idols, tie and dye clothes, some minerals and engineering goods are other items of export.

Conclusion

The present study indicates that only three very specialized urban centres are found in Rajasthan, i.e. one in the western part, another in the central part and a third in the southern part. It indicates that northern part lacks a very highly specialized centre. The western part of the state due to its desert condition has less specialization in functional hierarchy. However some centres of these areas are specialized in woollen industry. Most of the factories located in these towns and cities are of small-scale nature, using the local raw materials and manufacturing consumable items. Only Ganganagar, Bikaner and Jodhpur centres provide a few employment opportunities to the people in the region because of their industries. Some crops like cotton, sugarcane and oil seeds are grown in the eastern parts of Rajasthan and, therefore, some agro-based industries related to these crops are located here. The eastern industrially more developed region includes Ajmer, Dausa, Jaipur, Alwar, Bharatpur and other adjoining areas. The number of workers engaged in industries located in the northern part is greater than the southern part especially of Udaipur, Banswara and Doongarpur. Industrial activities in Kota and its neighbouring area are better developed because of hydropower and broad gauge railway line facilities.

Major industries of Rajasthan based on agriculture, minerals, forest and animal resources are established in the area of Khetri – Jaipur region, Makrana Ajmer – Beawar region, Bhilwara – Chittorgarh region, Udaipur, Alwar, Kota – Bundi – Sawai Madhopur region, Bharatpur – Dholpur region, Ganganagar, Bikaner and Jodhpur region.

References

Aurousseous, M. (1921): Distribution of Population: A Constructive Problem, *Geographical Review*, Vol. II: 574.

Makenzie, R.D. (1925): *The Ecological Approach to the Study of the Human Community, in The City* by R.E. Park, F.W. Burges and R.D. Makenzie (Eds.), Chicago.

Hall, R.B. (1934): Cities of Japan: Notes on Distribution and Inherited Form, *Annals Association American Geographers*, Vol. 24: 83.

James and Nath (1954): *Urbanization in India with Special Reference to Growth Cities*, World Population Conference, Rome 1954. Monographed, p. 4.

Harris, C.D. (1943): A Functional Classification of Cities in United States, *Geogr. Review*, Vol. 33: 86-91.

Nelson, H.J. (1955): A Service Classification of American Cities, *Economic Geography*, Vol. 31:189-210.

Berry, B.J.L. and W. L.Garrison, (1958): Functional Base of Central Place Hierarchy, *Economic Geography*, Vol. 34: 145-154

Raffiullah, S.M. (1965): A New Approach to Functional Classification of Towns, *The Geographer*, Vol. XII: 40-53

Mitra, Ashok (1967): *Internal Migration and Urbanisation in India*, Registrar General's Office, New Delhi: 35-81.

Webb, J.W. (1959): Basic Concepts in the Analysis of Small Urban Centres of Minnesota, *Annals of Association of American Geographers.*

Sinha, Vishwa Nath Prasad (1976): *Chhota Nagpur Plateau, A Study in Settlement Geography*, Chapt. 8, p. 134, Patna.

R.N. Mishra
Associate Professor
Pawan Kumar Sharma
Senior Research fellow (S.R.F.),
Department of Geography
University of Rajasthan,
Jaipur