

PATTERN OF INTERACTION

General Nature of Interaction

Interaction among urban settlements, including small towns and market centres, takes place in two ways. First, interaction occurs hypothetically among all the market centres, each centre having functional linkages with all the other urban/market settlements of a region. Second, urban centres have linkages to a varying degree with the surrounding rural areas. The former occurs at the inter-urban level and the latter at the rural-urban level. For inter-urban interaction, there must be complementary demand and supply. Demand and supply include different components such as trade, administration, social activity, technology, etc. The inter-urban interaction pattern in most parts of Nepal, including the Bagmati Zone subregion, is conditioned by trade flow. This can be analysed by observing the sources of trading commodities in market centres. For trade interaction between two market centres, there must be a demand in one centre that is supplied by another. Demand and supply must be complementary. However, complementarity cannot generate interaction between two market centres if there is an intervening opportunity between them. Therefore, the potential for movement of goods from one centre to another exists only when there is no intervening opportunity. The third important condition for trade interaction is transferability as expressed time and money costs. If these costs are very high, the movement of goods will not take place despite the fulfillment of the other two conditions.

Interaction also occurs between market centres and rural areas. Every urban settlement, whether it is a service centre, market centre, town or city, to a varying degree, is a centre for services to surrounding rural areas. The surrounding rural areas rely upon and make increasing use of services and institutions located in the urban settlements. Some of these services are distributed from the urban centres to the population concentrated around them, but many must be sought, involving journeys to and from an urban centre. Rural-urban linkages are a two-way phenomenon. If the surrounding rural areas receive services from the urban centres, the latter are dependant on rural areas for the supply of agricultural crops, dairy products, and a variety of industrial raw materials. A market town, whether expressed in terms of an array of functions or order, is associated with a given population (threshold) which it services and a maximum distance to which goods or services are distributed on a regular basis (range). The extent of rural-urban relationships is markedly conditioned by accessibility. The latter can be measured in terms of physical distance, physical effort, time, and cost factors. Thus, the relationship between the market centres and their surrounding rural areas involves overcoming a number of constraints which can be generalised in the phrase 'friction of space'. It is clear that consumers must travel the distance between the market centre and their place of residence. The delivered price of the commodities increases according to the distance from the place of residence to the market centre, as the consumers have to pay the shop price in addition to transport costs. However, time may be sacrificed to a certain extent in consideration of the monetary gains that can be obtained by shopping in centres with relatively low price levels. In certain cases, transport costs may be ignored to avoid the physical exertion involved in walking along steep mountain trails. In areas where public transport facilities are not available, the people have no other option than to walk. Under such conditions, time units rather than transport costs will be of greater concern.

Inter-urban Interaction

Inter-urban interaction is measured by observing the sources of trading goods. For this purpose 12 higher order centres (I&II) and 11 lower order centres (third order = six and fourth order = five) have been selected.

The condition under which trade interaction occurs among the market centres in the Bagmati Zone subregion is demand for trading goods in all observed 23 market centres and supply from six centres. In fact, there is a virtual absence of trade interaction among most of the centres measured in terms of supply of trading commodities. Six supply centres include two first order centres (Banepa and Bidur), three second order centres (Dhulikhel in Kavrepalanchowk district, Dhading Besi in Dhading district, and Chapagaun in Lalitpur district), and one fourth order centre (Betrawati in Nuwakot district). In fact, only two centres (Banepa and Bidur) appear to be important sources of trading goods for other local market centres. The other four centres are insignificant, each interacting with one centre (Table 8.1).

Bidur contributes 59 per cent of the total supply of trading goods to the four market centres which receive goods from it. Banepa supplies about 36 per cent of the total supply of trading goods to the four market centres interacting with it. Out of the four market centres to which Banepa supplies goods, three are located in the Kavrepalanchowk district and one (Chautara) in the Sindhupalchowk district. Out of the four market centres depending on Bidur for the supply of goods, two (Dhunche and Kalikasthan) are located in the Rasuwa district, and two in the Nuwakot district (Figure 12). The supply of goods from Bidur and Banepa amounts to 10.5 and 6.3 per cent respectively of the total supply of goods to all the observed 23 market centres. Out of the four centres obtaining goods from Banepa, Chautara is highly dependant on Banepa. Similarly, two centres (Dhunche and Kalikasthan) receive most of their trading goods from Bidur.

A study conducted in 1977 showed that Banepa had trade interactions with 38 local market centres. In this respect, Banepa appears to be more important than Bidur. The city of Kathmandu acts as a far superior intervening opportunity in the context of both these market towns. This has greatly limited the flow of trading goods from them to other local market centres. Bidur is well placed due to its location (relatively far away from Kathmandu). So other centres, e.g., Dhulikhel and Panauti in the case of Banepa and Betrawati in the case of Bidur, exist as intervening opportunities which limit the flow of goods from these towns to other local market centres.

Thimi, although ranked as a first order market town of the study area, is not an important source of trading goods to any local market centre. The use of this town as a source of trading goods is highly restricted due to the far superior intervening opportunities provided by the cities of the valley.

One obvious interaction pattern that is discernible (Figure 12) is the pre-eminence of Kathmandu city as the main source of trading goods for the local market centres. Out of the centres covered, 22 market settlements have trade linkages with this city. Larger order centres depend more on Kathmandu than lower order centres for the supply of trading goods. There is a successive, gradual decline of dependency on this city from the higher order to lower order

centres, with an average share of 75 per cent supply in the first order centres, 66.9 per cent in the second order centres, 47.3 per cent in the third order centres, and 43.8 per cent in the fourth order centres. Both complementarity and transferability are highly favourable for the development of interaction in the context of Kathmandu. Recently transferability has improved considerably after the development of modern highway linkages. Kathmandu has ideal conditions for being a supply centre, i.e., it is the primary city in the country. Greater concentration of economic activities in this city and the development of new modes of transportation have enabled the local traders to obtain goods, not from nearby higher-order centres, but directly from Kathmandu. As a result, the importance of larger centres, such as Lalitpur, Bhaktapur, Thimi, Banepa, Bidur, Dhulikhel, Panauti, and Barahbise, has been declining rapidly as intervening opportunities in the case of Kathmandu. Some of the small centres have completely substituted Kathmandu for immediate and closer centres in obtaining goods. Lalitpur and Bhaktapur are not important sources of trading goods for the market centres of the Bagmati Zone subregion. None of the centres located outside the Kathmandu Valley appear to interact with Lalitpur, and only one centre has some trade linkage with Bhaktapur. However, Lalitpur continues to be an important source of goods for most of the market centres in Lalitpur district. These centres do receive goods from Kathmandu city as well. Unlike this situation in the context of Kathmandu-Lalitpur, most of the market centres in the Bhaktapur district interact more with Kathmandu than with Bhaktapur. Kathmandu city provides 57.1 per cent of the total supply of trading goods to the market centres of the Bagmati Zone. The supply of goods from Lalitpur and Bhaktapur amounts to only 6.1 per cent and 0.6 per cent respectively.

Bharatpur's importance (in Chitwan district) as a supply centre is reflected in its connection with the market centres in Dhading district. This town exists as an important intervening opportunity, competing with Kathmandu for the supply of trading goods to the market centres in this district. The supply of trading goods from Bharatpur amounts to 6.3 per cent of the total supply of trading goods to the market centres in the study area.

Foreign sources were observed in only two centres, Banepa (I) and Barahbise (II). Both India and China are sources of trading goods for Banepa, while China is an important source for Barahbise. The latter phenomenon is a recent development, partly arising from the border location of Barahbise. The supply from these foreign sources amounts to 2.3 per cent of the total supply of trading goods to the local market centres.

It is clear from Table 8.1 that internal interaction in the individual centres is significant. In other words, if interaction of a settlement with itself exists in a number of cases, this sort of interchange is relatively important in large centres such as Banepa, Bidur, Thimi, Chapagaun, Lubhu, and Pharping and it does not take place in most of the lower order centres. This internal interaction involves 6.9 per cent of the total supply, measured in terms of supply to the 23 centres considered for the present analysis.

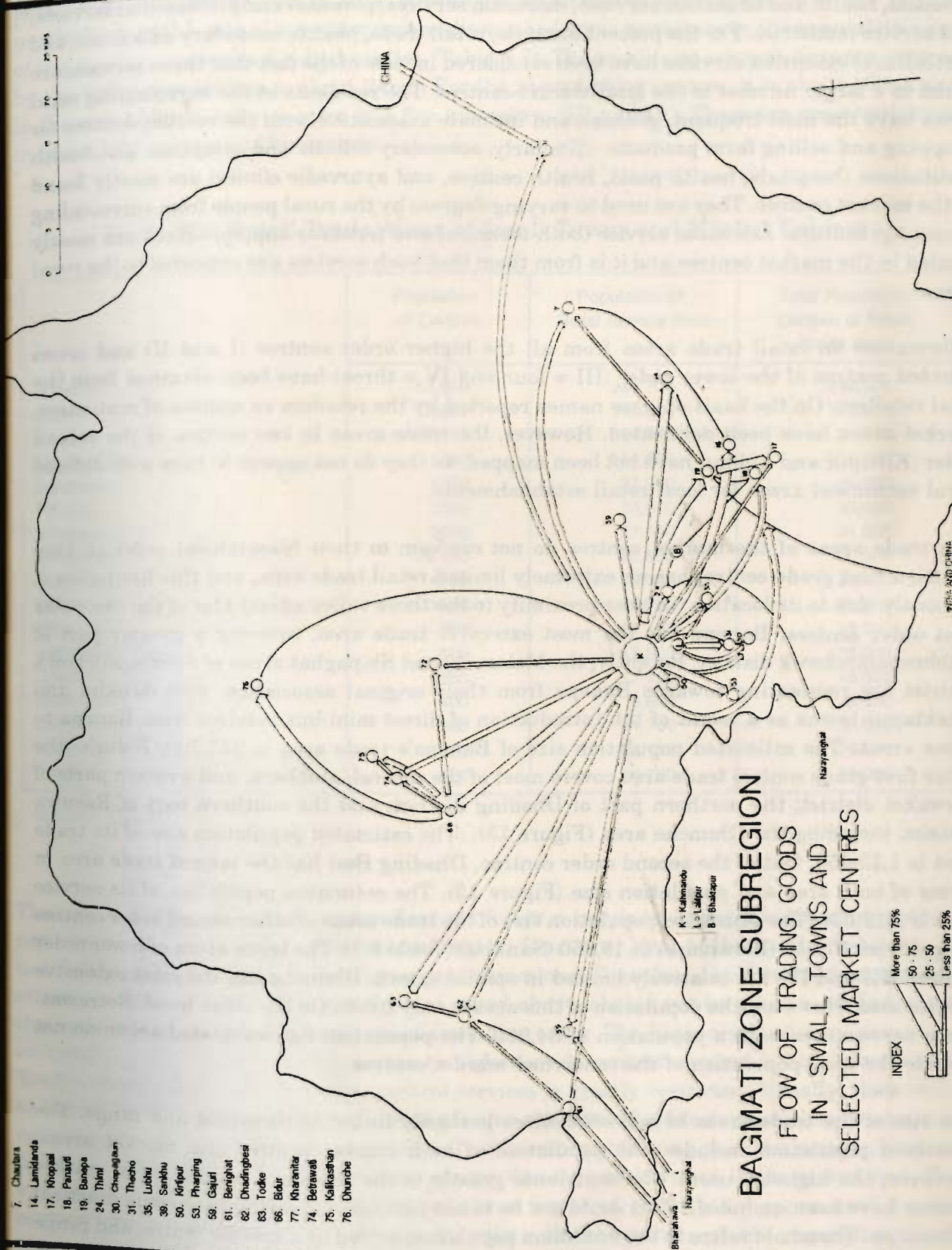
The local traders have developed notable trading behaviour. It can be observed in a number of cases that the local retailers and wholesale dealers visit Kathmandu to purchase larger amounts of goods on a non-credit basis, while they usually patronise other higher order centres in this area to purchase commodities on a credit basis. The effect of intervening opportunity ceases to influence trade interaction very often when the benefit of credit trade is available. It is due to this simple reason that the wholesale trade areas of some of the local centres extend beyond the limit of the normal retail trade areas. This can be observed in the case of Dhulikhel.

Table 8.1: Sources of Trading Goods in Small Towns and Market Centres

Centres	Supply Sources of Trading Goods in Percentage										
	Kathmandu	Lalitpur	Bhaktapur	Banepa	Bidur	Dhading	Barahbise	Dhulikhel	Chapagaun	Betrawati	Local
Banepa I	70	-	-	-	-	-	-	-	-	-	28
Bidur I	80	-	-	-	-	-	-	-	-	-	20
Thimi I	67	-	7	-	-	-	2	-	-	-	24
Kirtipur II	96	-	-	-	-	-	-	-	-	-	4
Sankhuwasabha II	93	-	-	-	-	-	-	-	-	-	7
Dhulikhel II	100	-	-	-	-	-	-	-	-	-	-
Chapagaun II	40	46	-	-	-	-	-	-	-	-	14
Lubhu II	39	44	-	-	-	-	-	-	-	-	17
Panauti II	70	-	8	22	-	-	-	-	-	-	-
Barahbise II	50	-	-	-	-	-	-	-	-	-	-
Dhading Besi II	51	-	-	-	-	-	48	-	-	-	-
Chautara II	63	-	-	32	-	-	-	5	-	-	-
Khopasi III	25	-	-	75	-	-	-	-	-	-	-
Pharping III	78	-	-	-	-	-	-	-	-	-	22
Thecho III	14	50	-	-	-	-	-	-	-	23	-
Gajuri III	73	-	-	-	-	-	27	-	-	-	-
Lamidanda III	75	-	-	15	-	-	-	-	-	-	-
Dhunchhe III	19	-	-	-	81	-	-	-	-	-	-
Benighat IV	30	-	-	-	60	-	70	-	-	-	-
Kalikasthan IV	-	-	-	-	-	-	-	-	-	40	-
Todke IV	75	-	-	-	-	25	-	-	-	-	-
Kharanitar IV	45	-	-	-	50	-	-	-	-	-	5
Betrawati	69	-	-	-	41	-	-	-	-	-	-
Total (Average)	57.1	6.1	0.6	6.3	8.8	1.1	6.3	0.2	1.0	3.3	6.9
											2.3

Source: Survey

- 7. Chauri
- 14. Lamidanda
- 17. Knapal
- 18. Poudi
- 19. Bonpa
- 24. Thini
- 30. Chapaajam
- 31. Thecho
- 35. Luthu
- 38. Sandhu
- 50. Kripur
- 53. Phaping
- 58. Gajul
- 61. Benghat
- 62. Dhadinghesi
- 83. Todte
- 86. Bidur
- 77. Kharanitar
- 74. Betrawal
- 75. Kalkashan
- 76. Dhunde



Rural-Urban Relationship

In the study area rural-urban linkages are markedly reflected in shopping and selling of farm products, health and education services, extension services, personal and professional services, and service industries. For the present analysis, retail trade, health, secondary education, and agricultural extension services have been considered in view of the fact that these services are found in a larger number of the local market centres. The residents in the surrounding rural areas have the most frequent, general, and intimate association with the market centres for shopping and selling farm products. Similarly, secondary schools and campuses and health institutions (hospitals, health posts, health centres, and ayurvedic clinics) are mostly found in the market centres. They are used to varying degrees by the rural people from surrounding areas. Agricultural extension service (both technical and fertiliser supply) offices are mostly located in the market centres and it is from them that such services are extended to the rural areas.

Information on retail trade areas from all the higher order centres (I and II) and seven selected centres of the lower order (III = four and IV = three) have been obtained from the local retailers. On the basis of place names reported by the retailers as sources of customers, market areas have been delineated. However, the trade areas in two centres of the second order (Kirtipur and Lubhu) have not been mapped, as they do not appear to have well-defined rural catchment areas for local retail establishments.

The trade areas of the market centres do not conform to their hierarchical order *in toto*. Thimi, a first grade centre, has an extremely limited retail trade area, and this limitation is obviously due to its location (in close proximity to the three valley cities). Out of the two other first order centres, Banepa has the most extensive trade area, covering a greater part of Kabhrepalanchowk district. Recently, the Melamchi and Shipaghat areas of Sindhupalchowk district are reorienting towards Banepa from their original association with Sankhu and Bhaktapur towns as a result of the introduction of direct mini-bus services from Banepa to these areas. The estimated population size of Banepa's trade area is 245,700. Bidur's (the other first grade centre) trade area covers most of the central, northern, and western parts of Nuwakot district; the northern part of Dhading district; and the southern part of Rasuwa district, including the Dhunche area (Figure 13). The estimated population size of its trade area is 1,13,450. Out of the second order centres, Dhading Besi has the largest trade area in terms of both area and population size (Figure 13). The estimated population of its service area is 1,16,000. The estimated population size of the trade areas of other second order centres ranges from 37,950 (Barahbise) to 18,250 (Sankhu) (Table 8.2). The trade areas of lower order centres (III and IV) are relatively limited in spatial extent. Dhunche has the most extensive service area. However, the population of this area is only 8,600. On the other hand, Betrawati has a service area with a population of 34,000. The population figures quoted above do not include the local population of the concerned market centres.

The size of the trade areas of market centres is closely linked to threshold and range. The threshold population includes the population of both market centres and market areas. However, the highway users who contribute greatly to the threshold population of market centres have been excluded. This could not be taken into account owing to obvious practical difficulties. Threshold refers to the minimum population served by a specific centre, and range is the maximum distance that the consumers are willing to cover for visiting market centres

of specific grades. It is found that the (average) threshold population of the two first order centres (Bidur and Banepa) is 1,95,000, while that of the second grade centres is 39,000. The average threshold population of the lower order centres (III and IV) is 20,000. The average population does not appear to be a meaningful reference in some cases, and this is true particularly in the case of low order centres because of great variations in the population sizes of the market areas of individual centres (Table 8.2). The maximum average distance covered by the first order centres is about 34km. For the second order centres, it is about 10km, and in the case of lower order centres it is five kilometres (III and IV). There are great variations in individual centres in this respect.

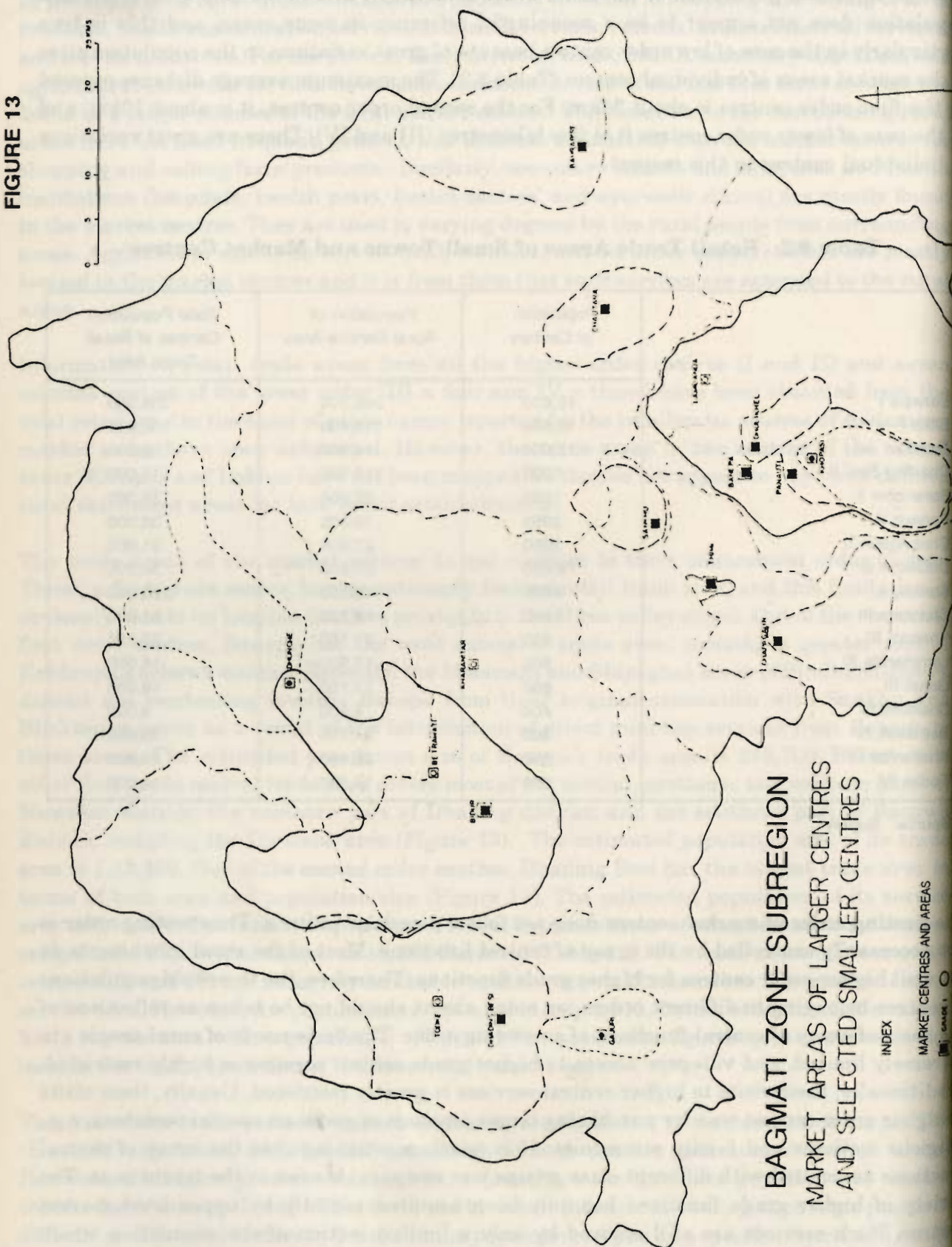
Table 8.2: Retail Trade Areas of Small Towns and Market Centres

	Population of Centres	Population of Rural Service Area	Total Population Centres of Retail Trade Area
Banepa I	12,600	245,700	258,300
Bidur I	18,800	113,400	132,200
Thimi I	17,050	14,950	32,000
Dhading Besi II	1200	114,800	116,000
Barahbise II	1050	37,900	39,000
Panauti II	2950	30,000	33,000
Chapagaun II	3950	27,000	31,000
Dhulikhel II	79,650	20,800	30,000
Sankhu II	4750	18,300	23,000
Chautara II	1300	19,700	21,000
Khopasi III	850	21,150	22,000
Lamidanda III	500	17,500	18,000
Gajuri III	850	17,150	18,000
Dhunche III	400	8,600	9,000
Betrawati IV	300	34,700	35,000
Kharanitar IV	850	28,150	29,000
Todke IV	250	14,750	14,000

Source: Survey

The nesting order of market centres does not follow a regular pattern. This nesting order is not necessarily controlled by the array of central functions. Most of the rural inhabitants do not visit higher-order centres for higher grade functions. Therefore, the threshold populations of centres belonging to different orders, as noted above, should not be taken as reflections of the basis of array of central functions of ascending order. The basic needs of rural people are extremely limited, and villagers' access to higher grade central services is highly restricted. Traditionally, their visits to higher central services is greatly restricted. Usually, their visits to higher order centres was for purchasing larger amounts of goods on special occasions, e.g., religious festivals and family ceremonies. It is worth mentioning that the array of central functions associated with different class groups was comparable even in the recent past. The variety of higher grade functions has only been acquired recently by upper level market centres. Such services are still enjoyed by only a limited section of the population which belongs to a higher socioeconomic stratum.

FIGURE 13



In a number of cases, the viability of lower order centres is in jeopardy. Owing to changes in local economic conditions, greater concentration of activities in Kathmandu city, and development of new modes of transportation, trades of small lower order centres have increasingly started to obtain the goods and services they require not from nearby, slightly higher order centres, but from Kathmandu, even though the commuting distance is greater. The performance of intermediate functions by intermediate order centres for lower order centres is gradually decreasing. The people, particularly traders from lower order centres, tend to choose Kathmandu instead of intermediate and closer centres to purchase higher grade goods and services which cannot be obtained in the local, small market centres.

Educational and health services are other important service components which promote closer rural-urban linkages. Market centres are usually the seats of educational and health establishments, providing services to the surrounding rural areas. Out of the 77 small towns and market centres covered in the study, 57 centres have secondary school facilities, while higher educational (campus level) facilities are available only in Banepa and Bidur outside the valley. Health services are available in 39 centres out of which 37 have both educational and health service facilities. There are hospitals only in some upper level centres - two first grade centres (Bidur and Banepa) and three third grade centres (Chautara, Dhunche, and Dhading Besi). These hospitals provide services to rural areas in the Kavrepalanchowk, Sindhupalchowk, Nuwakot, and Dhading districts. The hospital in Banepa is a special case. It serves the urban population of the Kathmandu Valley as well. On the other hand, the hospital located in Dhunche is underused. This is due to its location in a sparsely populated area.

It is clear from Table 7.2 that all the upper grade centres (I and II), apart from Panauti, provide both educational and health services. On the other hand, only 37 out of 65 lower grade centres (III and IV) have both of these service facilities. In terms of the common location of these services, the market settlements in Rasuwa and the Kathmandu Valley are good places. The situation is relatively better in the Kavre-palanchowk district also. These two services do not share common locations in most of the market centres of Sindhupalchowk, Dhading, and Nuwakot districts. It is clear that educational facilities (schools) are available in a larger number of centres than health service facilities. Rural people have to visit two different locations for these two services in several areas. This is particularly so outside the Kathmandu Valley. In Rasuwa district, all three market centres have areas with both these services. The rural-urban relationship pattern, measured in terms of educational and health services provided by the 77 market centres, does not reflect the local conditions in a realistic way as there are a large number of other centres providing these services. There are 39 smaller centres that provide both health and educational services, 21 centres with health services only, and as many as 185 other centres with educational services such as secondary schools. The distribution of these centres is given in Table 7.2.

The central areas with secondary schools are markedly dispersed, and the dispersion pattern conforms fairly well to the distribution of population clusters in the study area. If the remote rural population pockets are excluded, the service areas of secondary schools fall within the limit of five kilometres. Some higher order centres, such as Bidur, Dhulikhel, Banepa, Dhading Besi, and Chautara, receive students from distant places, as they offer hostel facilities and other attractions. As health service facilities are available only in a limited number of centres, health service areas are comparatively more extensive than school service

areas. It should be noted that, unlike educational services, health services are not regularly used by the local rural people. Hence, this service does not contribute much to development or to rural-urban linkages.

Rural-urban relationships have further developed with the growth of agricultural extension services, including both technical and fertiliser supply services in most of the local market centres. Agricultural and technical extension services are available in 38 centres and fertiliser supply services exist in 45 centres (Table 7.1). Ten upper level centres out of 12 (I and II) provide technical services, while all these centres provide fertiliser supply services. On the other hand, only 28 lower grade centres (III and IV) provide technical services and 32 centres provide fertiliser supply services. It can be observed that the service area of a technical extension service unit is more extensive than the fertiliser supply service area in most cases. Long distance linkages for these services are, uncommon apart from high level technical services provided by district headquarters, e.g., Dhulikhel, Chautara, Bidur, Dhading Besi, and Dhunche. The precise delineation of the areas covered by these extension services does not appear to be important, as these services are available in other smaller centres (not covered in the present study) on which information is not available.

Threshold Population of Services

As noted earlier, the local market centres provide a range of services which vary in number from 14 types in Banepa to two types in Adamghat. Different service functions require certain population levels for growth. The minimum population size is referred to as the threshold population. This threshold population can be expressed in terms of average population size of service areas in different service establishments located in the local market centres. For this purpose, three services have been selected. These include retail, secondary school education and banking services. It is true that service areas of retail services vary in spatial extent according to the type of goods offered. General shopping goods, e.g., clothes, serve larger service areas than ordinary shops dealing in goods like food grains. This differentiation has not been possible in the local market centres as shop units handle a mixed variety of goods both convenience and non-convenience. Out of the 17 centres on which information has been collected to determine the service areas of retailing services, in four larger centres (Banepa, Bidur, Dhading Besi, and Panauti), nesting of service areas can be observed. While computing the average population of service areas, these centres are excluded. The average population size of service areas with regard to retailing appears to be 25,600. It is 20,000 if the average population is computed, or lower order centres (III and IV) only. The service area of a secondary school (educational services) has an average population of 7,500. A banking service unit serves an average population of 12,400 (Table 8.3).

Table 8.3: Threshold Population of Selected Services in the Market Centres

Services	Average Population of Service Area
Retailing	25,600
Banking	12,400
Secondary School Education	7,500

Source: Survey

The local situation reflects the fact that retailing requires a relatively large threshold population. This threshold population size is supposed to be met in the local service area (within walking distance) of a lower order market centre. Larger centres like Banepa and Bidur serve distant locations by offering higher order services along with other attractions. It is due to this reason that the service areas of retailing services in larger centres are relatively extensive. The service area of a secondary school lies within certain limits, e.g., normally one hour's walking distance, apart from some larger centres where students commute long distances owing to the availability of hostel or accommodation facilities. Banking services come in between retailing and educational services (secondary schools) regarding the threshold population in lower order market centres. Unlike in retailing and educational services, banking does not show great variation in population sizes of service area in individual market centres.