Studies on commodity flow have been done in different countries since 1950s. The study of Ullman (1957) of U. S. commodity flows has been considered as a pioneering work. Alampieve (1959), Probst (1962), Bedenkova (1964) and Kistanov (1965) have highlighted the flow of commodities and formation of economic regions in Soviet Russia. Similarly, other studies on commodity flow and its significance in economic development and regionalization have been made in USA, Germany, Japan, England, Poland and Canada (Raza and Aggarwal, 1986). In India, on the basis of flow of commodities, metropolitan regions have been identified by Berry.


Hisar is predominantly an agricultural district. The district has fertile land, a developed system of canal irrigation provided by distributaries of Bhakra and Western Yamuna Canals, supplemented by electrified tube-wells and oil operated engines. The formation of Haryana and initiation of ‘Green Revolution’ (1966) have ushered a new era of growth in the district. Big strides were taken in agricultural development through increasing irrigated area, diversification and intensification of agricultural production by adoption of Green Revolution strategy. Commercialization of agriculture in growing both the food crops and cash crops is seen in the nature of acquisition of this new technology.

As a result, the intensity of cropping showed a marked upward trend since formation of Haryana in the district. In 1964-65, the intensity of cropping was 115 per cent which increased to 182 per cent in 2009-10. The government is making all efforts to increase agricultural production by distributing improved seeds, fertilizers, pesticides, providing latest developments in modern techniques, multiple cropping pattern techniques, increasing irrigation facilities and providing easy loans for modern
agricultural machinery. Cropping pattern has also greatly changed. Earlier barley, bajra, 
gram and fodder crops covered a major area but with increasing irrigation facilities, 
percentage area under these crops has greatly decreased and that under rice, wheat, 
cotton and oilseeds have increased. Major kharif crops of the district are bajra, cotton, 
rice and pulses. Besides, wheat, gram, barley, vegetables, sugarcane and oilseeds are 
rabi crops. The district is one of the intensively cultivated areas for wheat and cotton on 
commercial scale. In terms of production of cotton, bajra, wheat and gram, the district 
was ranked 2nd, 4th, 3rd and 2nd respectively in 2009-10. Thus, agriculture has acquired 
new dimensions from being consumption oriented to become market-oriented.

Development and use of hybrid seeds, chemical fertilizers, plant protection and 
other scientific methods of farming have increased the yield manifold. Nowadays, with 
increased facilities of irrigation, there is a shift towards horticulture crops (fruits, 
vegetables, flowers, medicinal plants, spices, strawberry and mushroom) due to huge 
benefits in their cultivation. Fruit cultivation became a commercial enterprise in the 
district with the inception of garden colonies set up at Hansi and Uklana. The soil and 
climate are suitable for cultivation of ber, citrus fruits, guava, grapes, pomegranate and 
mango in the district (Gazetteer, 1987).

People have adopted dairy-farming as a subsidiary occupation by seeing the 
increasing consumption of milk in urban centres and huge benefits in it. Hisar district is 
renowned for its Haryana breed of cattle and Murrah breed of buffaloes and holds 
unique position in India. Agro-climatic conditions are conducive to livestock 
population and a good majority of buffaloes and cattle are of superior breed (Census of 
India, 2001).

Poultry breeding was in its infancy in 1990s, which has also taken grounds in 
the district. Fishing is done in canals, ponds and other reservoirs. Fishing rights in 
rivers and canals are controlled by the state government. The fish culture is also 
propagated in village ponds which are under the control of respective panchayats.

Location of Haryana Agriculture University, a high seat of learning and 
research in agriculture and allied sciences, has also brought most spectacular 
transformation in agricultural economy of the district. Developing rural economy has
established both forward and backward linkages with urban centres. Consolidation of landholdings in 1960’s gave a great fillip to the installation of tube-wells and purchase of tractors and their accessories. Increase in agricultural production due to mechanization, use of fertilizers and improved seeds and increased irrigation facilities led to much improvement in the economic well-being of the agriculturists further leading to wipe out their debts and have an improved standard of living. Slowly and steadily, they began to adopt modern facilities. Now, most of the people have pucca houses, means of transport, electricity, educational facility, medical care and above all more employment have made a decent rural living (Thakral, 2011).

Agricultural produce is marketed in the mandis of Hisar, Hansi, Uklana, Adampur, Barwala and Narnaulnd. Balsmand, Sisai Bolan, Agroha, Seeswal, Sarsod and Pabra villages are also functioning as sub-centres for this purpose. Supply of milk, vegetables, fruits, poultry products and fish products is made mostly to the urban centres. Modern network of transportation and commercialized farming etc. economic transformations stimulated the development of new towns to act as nodes of communication and centres of trade. Emergence of Barwala and Narnaund towns in 1978 is testimony to it.

The increased agricultural production, which is a pre-requisite to industrialization, brought the development of various agro-based industries and new ancillary industries in the district. These industrial units produce cotton yarn, vanaspati ghee, flour, maida and suji, poultry vaccines, guar split, certified seeds, mustard oil, dal, sugar and agricultural implements. Moreover, cotton ginning, pressing and crushing of cotton seeds, cloth manufacturing, handloom textile and ice making are also in operation in the district. Most of these industrial units are result of Green Revolution and have emerged as a hub of commodity exchange because of bringing in raw material for these industries from rural areas and supply of the product from these industries to the urban centres.

Thus, the towns predominantly specialize in the production of industrial goods and the villages in agricultural production. Such a specialization results in exchange between them. Urban industrial sector is found opposed to a rural peasant sector which is subsumed within a system of commodity production and exchange (Harvey, 1985).
Earlier, Old Grain Market and Kath Mandi were functioning in Hisar city. But after formation of Haryana, many new market centres have come into existence in the city such as Rajguru Market, Auto Market, Red Square Market, Cloth Market, New Anaj Mandi and New Sabji Mandi. Marketing Complexes like Pushpa and Parijat also promote commodity exchange in the city. At Hansi, major centres of commodity exchange are Anaj Mandi, Sabji Mandi, Kath Mandi and Cloth Market. Besides Hisar and Hansi, increasing tendency of commodity exchange has promoted Uklana, Narnaul, Barwala like towns and Adampur, Agroha and Balsmand like rural service centres for commodity exchange.

Towns in relation to their surrounding villages supply employment and work as a market for country produce. Country people come to the town to do their shopping. Earlier peddlers used to go from village to village with different products but today, local trade is taken in hand by middleman who make contracts to supply the village grocer or who run a chain of village stores. These businessmen buy in bulk and store and distribute the goods as required. In fact, town has entered the village physically through a number of shops and development of small markets.

In the celebration of the rituals of life cycle, particularly marriage and death ceremonies, where hundreds of persons have to be provided with dinner and all types of gifts, the villagers enter into multiple interactions with the nearby urban centres. Gifts to brids launches include scooters and motorcycles, cars, costly wrist-watches, clothes made of synthetic fibres and all sorts of electrical gadgets like television and cooler. Gifts to brides include ornaments usually obtained from urban jewelers, saris either of silk or nylon, household decorations including furniture like double beds, sofa-sets, dressing tables and kitchen utensils in increasing number (Sharma, 1977). Thus, wedding, birth ceremonies and death rituals promote commodity exchange.

Different fairs at different places like Landhri Sukh Lambran, Siswal, Uklana (cattle fair), Hisar (cattle fair), Barwala, Daulatpur, Rakhi Shahpur and Narnaul and religious fairs in the district at Kirnara, Harita, Jagan, Pabra, Banbhor, Bas Azam Shahpur, Bas Badshahpur, Bhairi-Akbarpur, Balsmand, Hisar and Agroha promote commodity exchange as traders install their stalls for the sale of different commodities.
Thus, commodity flows have various dimensions like social, economic and cultural. Geographers have used the criteria of commodity flow to delineate the umland of cities in numerous studies by taking the indicators regarding supply of milk and vegetables (Chauhan, 1970). Since data on such indicators is not available in secondary sources, the proxy indicators like (i) percentage of irrigated land to total cultivated area and (ii) percentage of cultivable land to total area have been used in the present study. These indicators would reveal the intensity of agriculture leading to agricultural surplus to promote commodity flows through forward and backward linkages. Villages in the district have been grouped into three categories of High, Moderate and Low levels of commodity exchange on the basis of their index values.

This chapter has been divided into two sections. In the discussions of the first section, an attempt has been made to analyse the spatial patterns of commodity exchange in district Hisar from 1971-2001; whereas in second section, change in the levels of commodity exchange has been discussed over the period of 40 years.

SECTION-I

1. SPATIAL PATTERNS OF COMMODITY EXCHANGE: 1971

There were wide inter-village differences in the levels of commodity exchange (Map 5.1). The index value ranged from a high of 99.04 in Kheri Barkesh village of Hansi-I block to a low of 41.92 in Chiraud village of Hisar-I block of the district. The range difference was 57.12. In other words, the village at the top had almost two-times (1.73) greater possibilities of interaction with an urban centre to sell marketable surplus and purchasing farm inputs. On the basis of index value in commodity exchange, 272 villages have been grouped into three levels of commodity exchange by identifying the critical breaks in distribution of index values at village level.

(a) Areas of High Commodity Exchange Level

103 villages or more than one-third (37.87%) of the total villages in the study area recorded a high level of commodity exchange. These had an index value ranging from 99.04 in Kheri Barkesh village of Hansi-I block to a low of 80.08 in Rakhi Shahpur village of Narnaund block in the district. The range difference of 18.96 reveals that the village at the top differs by 1.24 times from the village at the bottom, which is not a wide gap. This is also supported by coefficient of variability value of 5.37 per
cent. In other words, villages falling in the category of high commodity exchange level exhibit low level of intra-category variations in terms of commodity exchange, which is also the lowest of all the three categories.

Villages with high commodity exchange level are located in the south-eastern part of the district. This is part of the Old Alluvial Plain, which consists of old relict course of river Drishdawati. In the recent past, the river flowed through Jind, Hansi and Hisar before it met Ghaggar in Rajasthan. Soil type varies from fine to coarse loamy (heavy loam/Rasauli soil) in these villages, which is good for cultivation after adequate rainfall or good irrigation. These villages had high intensity of irrigation because Hansi and Sunder distributaries from Western Yamuna Canal provided a good source of irrigation to these villages. Moreover, these villages being a part of the eastern part of district Hisar experience more rainfall (60-80 cm) compared to its western part (40-60 cm). Major concentration of these villages is in the east of Hisar and around Hansi city which was headquarter of the district till 1832 when it was shifted to Hisar. Because of proximity to the major town of the district and seeing the consumption of milk, vegetables and fruits; these villages took to diversification of agricultural activities in an earlier stage. Thus, commercialization and diversification of agriculture was an earlier day phenomenon in these villages. Most of these villages were located within 30 kilometers distance from Hansi up to Hisar in the west and border of the district in the east. These villages were also characterized by early connectivity with metalled roads due to their location around major transport routes.

Moreover, villages around Hansi are inhabited by Sainis, which is basically a vegetable growing community.

(b) Areas of Moderate Commodity Exchange Level

121 out of 272 villages or more than two-fifth (44.49 per cent) of the total villages in the study area were in this category. The value of the index varied from a low of 60.17 in Sundawas village of Hisar-II block to a high of 79.92 in Ladwi village of Adampur block in the district, giving a range difference of 19.75. The coefficient of variability value being 8.04 reveals that the villages falling in the category of moderate level do not differ widely in terms of commodity exchange.
A majority of these villages are located in the eastern part of the district except a strip of these villages in the western part. These are located in the Old Alluvial Plain with Sand Dunes which are stabilized or Upper Alluvial Plain. Soils of this plain varies from coarse to fine loamy which is very productive after irrigation. Irrigation in the eastern part of the district is good because various distributories from Western Yamuna Canal enter the district from the eastern side. From the north-eastern side of the district, Hisar major distributory enter the district, which is a good source of irrigation for the north-eastern part of the district where maximum concentration of moderate level of commodity exchange villages was found. Moreover, as a result of Green Revolution pumping sets or tubewells proved a boon to agriculture in this area. Due to adequate rainfall in the eastern part of the district, water table was also not low in this part. Good soil coupled with good irrigation provided impetus to the farmers for growing vegetables and fruits. Near Barwala and Uklana towns, cultivation of the vegetables and fruits became significant. Moreover, better network of roads in the eastern part compared to its western counterpart accelerated the process of commodity exchange.

(c) Areas of Low Commodity Exchange Level

48 or around one-sixth (17.65%) of the total villages in the district exhibited a low level of commodity exchange. The index value varied from a maximum of 59.70 in Bandaheri village of Hisar-II block to a minimum of 41.92 in Chiraud village of Hisar-I block in the district. This gave the range difference of 17.78. In other words, the village at the top had an index value 1.42 times higher than that of the village at the bottom. The coefficient of variability was 8.23 per cent. Obviously, intra-category variations in this case were not of a high order but were the highest of all the three categories (Table 5.1).

<table>
<thead>
<tr>
<th>Levels of commodity exchange</th>
<th>Average value for category</th>
<th>Standard deviation</th>
<th>Coefficient of variability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>87.96</td>
<td>4.73</td>
<td>5.37</td>
</tr>
<tr>
<td>Moderate</td>
<td>70.81</td>
<td>5.7</td>
<td>8.04</td>
</tr>
<tr>
<td>Low</td>
<td>52.73</td>
<td>4.34</td>
<td>8.23</td>
</tr>
</tbody>
</table>

Table 5.1
District Hisar: Levels of commodity exchange and their average, standard deviation and coefficient of variability; 1971

91
These villages were located in the western part of the district. Most of these were part of the Aeolian plain. In south-western part of the district, shifting sand dunes are found. The Bhur soils or coarse loamy soils predominate in the western and south-western parts of the district (Hisar tehsil). These soils are light, highly permeable and have little waterholding capacity. Rainfall is also low in this part of the district. Irrigation facilities were also inadequate. Most of the landscape in the western part of the district was moderately or severely eroded. All this resulted in less production from the fields. Low connectivity of these villages with the outside coupled with the above factors resulted in subsistence type of agriculture.

Briefly, around 38 per cent villages were in the category of high level of commodity exchange and approximately 45 per cent or more than two-fifth of the total villages fell in the moderate category. Commodity exchange was feature of the plain where fertile soils and developed irrigation system provided a fine base for agriculture. Introduction of tubewell irrigation in the post Green Revolution period played a significant role in increasing the agricultural production and degree of commercialization in the district. On the contrary, villages falling in the south-western part of the district had a little agricultural production owing to desertification of the land due to spread of the Thar Desert. Irrigation mainly depended on rain. Such villages failed to produce any marketable surplus to promote commodity exchange and had a low level of commodity exchange. In relative terms, intra-category variations were the lowest in the villages with high level of commodity exchange and the highest in the villages with low level of commodity exchange. However, the difference between these values was not wide and intra-category variations in all the three categories were of low level.

II SPATIAL PATTERNS OF COMMODITY EXCHANGE: 1981
There were wide inter-village differences in the levels of commodity exchange in 1981 (Map 5.2). The index value ranged from a high of 98.59 in Latani village of Uklana block to a low of 45.85 in Sadelpur village of Adampur block of the district. The range difference was 52.74. In other words, the village at the top had a little more than two-times (2.15) greater possibilities of interaction with an urban centre to sell marketable surplus or for purchasing farm inputs. Average for the district was
Map 5.2
District Hisar
Index of Commodity Exchange, 1981
(Data by Villages)

Highest Index Value: 98.59 (Latam)
District Average: 81.19
Lowest Index Value: 45.85 (Sadelpur)

81.19 which shows that most of the villages were in the upper range of commodity exchange. On the basis of index value in commodity exchange, 272 villages have been grouped into three levels of commodity exchange by identifying the critical breaks in distribution of index values at village level.

(a) Areas of High Commodity Exchange Level

159 villages or about three-fifth (58.45%) of the total villages in the study area recorded a high level of commodity exchange i.e. 56 more villages joined the category of high commodity exchange level in 1981 as compared to 1971. These had an index value ranging from a high of 98.59 in Latani village of Uklana block to a low of 80.11 in Mirka village of Hisar-1 block in the district. The range difference of 18.48 reveals that the village at the top differs by nearly 1.23 times from the village at the bottom, which is not a wide gap. The same is also supported by a coefficient of variability value of 5.56 per cent. In other words, villages falling in the category of high commodity exchange level have low level of intra-category variations in terms of commodity exchange; which is also the lowest of all the three categories.

Most of these villages were located in the eastern part of the district around Hansi, Narnaund, Barwala, Uklana towns and east of Hisar city. A few villages in the western part of the city were also included in the high level category of commodity exchange. These villages were part of the Old Alluvial Plain and Old Alluvial Plain with Sard Dunes (stabilized). Soil type varied from coarse to fine loamy. These soils were very deep, well-drained and had good water holding capacity. Rainfall in this part of the district varied from 60-80 cm, which was supplemented by good canal network in the eastern part of the district. Location of the towns in the eastern part of the district also resulted in the high level of commodity exchange in these villages. Because of demand of milk, vegetables, fruits and foodgrains in these towns, nearby villages took to diversification and commercialization of agricultural activities. Transport of these perishable products was supported by good road network in the eastern part of the district. Moreover, nearby villages of these towns were inhabited by Sainis, which is basically a vegetable growing community.
(b) Areas of Moderate Commodity Exchange Level

94 out of 272 villages or about one-third (34%) of the total villages in the study area fell in this category in 1981. The value of the index varied from a low of 60.38 in Asranwan village of Adainpur block to a high of 79.99 in Gangwa village of Hisar-1 block in the district giving a range difference of 19.61. The coefficient of variability value was 7.79 per cent which indicates that the inter-village variations in terms of commodity exchange were not wide in this category but this was the highest value for all the three categories.

These villages were scattered all over the district except the south-western part where shifting type sand dunes were a problem. These were part of the Old Alluvial Plain, Old Alluvial Plain with Sand Dunes (stabilized) and Aeol-fluvial Plain or it can be said that these were part of the Alluvial Plain and Aeolian Plain. Their soil type varied from fine to coarse loamy but in some villages of the western part of the district, sandy soil was also found. In most of these villages, canals provided a good source of irrigation. Moreover, introduction of tubewell irrigation in post Green Revolution period increased both irrigation extent and intensity resulting in increased agricultural production and commercialization. Encouraged by this, farmers in the district shifted more land under vegetable crops and fruits so as to maximize their benefits by meeting the increased demand for horticulture crops from the fast growing Hisar city. Subsistence type of agriculture was replaced by commercial type of agriculture.

Desert Development Programme launched in 1977 by central government also helped the western part of the district to emerge from its drought conditions. Moreover, increasing connectivity of these villages by this time in the western part of the district also helped them to come out of the low category of commodity exchange.

(c) Areas of Low Commodity Exchange Level

19 villages or about 7 per cent of the total villages in the district exhibited a low level of commodity exchange. The index value varied from a maximum of 59.96 in Mothsara village of Adampur block to a minimum of 45.85 in Sadelpur village of the same block in the district. The range difference was 14.11. In other words, the village at the top had an index value 1.31 times higher than that of the village at the bottom. The
The coefficient of variability was 6.88 per cent. Obviously, intra-category variations in this case were of a low order (Table 5.2).

Table 5.2

<table>
<thead>
<tr>
<th>Level of commodity exchange</th>
<th>Average value for category</th>
<th>Standard deviation</th>
<th>Coefficient of variability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>89.47</td>
<td>4.98</td>
<td>5.56</td>
</tr>
<tr>
<td>Moderate</td>
<td>72.59</td>
<td>5.66</td>
<td>7.79</td>
</tr>
<tr>
<td>Low</td>
<td>54.41</td>
<td>3.74</td>
<td>6.88</td>
</tr>
</tbody>
</table>

Most of these villages were part of Hisar-II block. These villages were located in the south-western part of the district which formed the part of Aeolian Plain. This plain has undulating topography because of sand dunes. Bhur soils predominate the western and south-western parts of the district (Hisar tehsil). These soils are light, highly permeable and have little waterholding capacity. Coarse loamy soils are also found in some of these villages. Inadequate rainfall and irrigation sources proved a handicap for them. Moreover, shifting type sand dunes aggravated the problem in cultivation. Therefore, these villages were hardly able to make their sustenance from their land holdings.

Briefly, a majority (58.45%) of the villages fell in the category of high level of commodity exchange. High commodity exchange was a feature of Alluvial Plain topography where fertile soils and developed irrigation system provided a fine base for agriculture. Introduction of tubewell irrigation in the post Green Revolution period played a catalytic role in increasing the agricultural production and degree of commercialization in the district. Consequently, these villages produced marketable surplus promoting commodity exchange in the district. Moreover, concentration of towns in the eastern part of the district also promoted commodity exchange in this part. On the contrary, villages falling in the western extremities of the district had subsistence agriculture due to desert topography of the area and sandy soil. Irrigation mainly depended on rain; thus resulting in generation of negligible marketable surplus to promote commodity exchange. Relatively, intra-category variations were the lowest in the high category of commodity exchange level and the highest in the moderate
category of commodity exchange level; though the difference in these values was minor and intra-category variations were of low order in all the three categories.

III SPATIAL PATTERNS OF COMMODITY EXCHANGE: 1991

There were wide inter-village differences in the levels of commodity exchange in 1991 (Map 5.3). The index value ranged from a high of 98.77 in Kheri Barkesh village of Hansi-I block to a low of 47.81 in Badon Rangran village of Hisar-I block of the district. The range difference was 50.96. In other words, the village at the top had two-times greater possibility of interaction with an urban centre to sell marketable surplus or for purchasing farm inputs. Average value for the district increased to 84.65 which indicates a high commodity exchange level in most of the villages. On the basis of index value in commodity exchange, 272 villages have been grouped into three levels of commodity exchange by identifying the critical breaks in distribution of index values at village level.

(a) Areas of High Commodity exchange Level

197 villages or more than two-third (72.42%) of the total villages in the study area recorded a high level of commodity exchange. These had an index value ranging from a high of 98.77 in Kheri Barkesh village of Hansi-I block to a low of 80.28 in Satrod Kalan village of Hisar-I block in the district. The range difference of 18.49 reveals that the village at the top differs by nearly 1.23 times from the village at the bottom, which is not a wide gap. The same is also supported by a coefficient of variability value of 5.53 per cent. In other words, villages falling in the category of high level of commodity exchange do not differ widely in terms of commodity exchange.

These villages covered around two-third part of the district on the eastern side. Most of these villages were part of the Alluvial Plain. Topography in these villages was almost levelled. Fine to coarse loamy soils of this plain provided good productivity coupled with good irrigation network. Not only canals but tubewells and pumping sets installed after Green Revolution also increased the intensity of irrigation to the greater extent in the district. This helped in increasing the degree of commercialization of agriculture. After having surplus production of foodgrains, these villages also had good production of cotton and oil-seeds to sell in the market. To make huge benefits, these villages started growing vegetables. By this time, even other communities started
District Hisar
Index of Commodity Exchange, 1991
(Data by Villages)

Highest Index Value: 98.77 (Kheri Barkesh)
District Average: 84.65
Lowest Index Value: 47.81 (Badon Rangran)

growing vegetables besides Suinis. Dairying also became a profession even in the distant villages to supplement the increasing demand of milk. By this time, villages surrounding Hisar and even in the western part joined the category of high level of commodity exchange. This happened because of increasing demand of milk, vegetables and fruits in the fast expanding city of Hisar after its development as a satellite town of National Capital Region of Delhi. These supplies were now possible even from far-off villages due to good connectivity.

(b) Areas of Moderate Commodity Exchange Level

68 villages or one-fourth (25%) of the total villages in the study area fell in this category in 1991. The value of the index varied from a low of 60.2 in Dobeta village of Hisar-I block to a high of 79.55 in Mangali Akalan village of the same block in the district, giving a range difference of 19.35. Coefficient of variability value was 6.84 per cent which reveals that inter-village variations in terms of commodity exchange were not of a high order in this category. However, this was the highest value for all the three categories.

Most of these villages were located in the western part of the district except a few, which were situated in between the high commodity exchange level villages in the eastern part. Most of these villages were part of the Aeolian Plain with coarse loamy and Bhur or sandy soils. Introduction of tubewell irrigation in the post Green Revolution period increased both irrigation extent and intensity leading to increased production of agriculture. In some fields, Drip and Sprinkler irrigation systems were also adopted to enhance the efficiency of irrigation after 1977-78. More land was cultivated under commercial crops. Use of land under fruits and vegetables increased to meet the demand of the city and maximize the benefits. Good connectivity was not a problem by this time to supply the produce. In sum, subsistence type of agriculture was replaced by commercial agriculture even in villages of the western part of the district except a few.

(c) Areas of Low Commodity Exchange Level

Only 7 villages out of the total 272 villages in the district revealed a low level of commodity exchange. The index value varied from a maximum of 56.49 in Gorchhi village of Hisar-II block to a minimum of 47.81 in Badon Rangran village of Hisar-I.
block in the district. The range difference was 8.68. In other words, the village at the top had an index value 1.18 times greater than that of the village at the bottom. The coefficient of variability was 5.14 per cent. Obviously, intra-category variations in this case were of a low order (Table 5.3). These were also the lowest of all the three categories.

Table 5.3

<table>
<thead>
<tr>
<th>Level of commodity exchange</th>
<th>Average value for category</th>
<th>Standard deviation</th>
<th>Coefficient of variability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>90.03</td>
<td>4.98</td>
<td>5.53</td>
</tr>
<tr>
<td>Moderate</td>
<td>72.31</td>
<td>4.95</td>
<td>6.84</td>
</tr>
<tr>
<td>Low</td>
<td>52.94</td>
<td>2.72</td>
<td>5.14</td>
</tr>
</tbody>
</table>

These villages were located in the western and south-western parts of the district with undulating landscape due to presence of shifting type sand dunes. These villages had low proportion of net cultivated land because of desert topography. Coarse loamy and sandy soils proved infertile due to inadequate irrigation facilities. Irrigation mainly depended on rain, which is mainly during the season from July to September. Consequently, agriculture was of subsistence nature with little surplus resulting in little interaction with outer world.

Briefly, a dominant majority (72 per cent) of the villages fell in the high category level of commodity exchange. High commodity exchange level was a feature of such plains where fertile soils and developed irrigation system provided a fine base for agriculture. Introduction of tubewell irrigation in post Green Revolution period and adoption of Drip and Sprinkler irrigation practices played a significant role in increasing agricultural production and the degree of commercialization in the area. Moreover, development of Hisar as a satellite town of NCR, Delhi proved a boon to the villages in the district. Consequently, these villages produced marketable surplus which encouraged commodity exchange in the district. On the other hand, villages falling in the desert topography had subsistence agriculture due to lack of proper irrigation system there. Irrigation mainly depended on rain. Such villages failed to produce any marketable surplus to promote commodity exchange. In relative terms, intra-category
variations were not of a high order in either of categories. However, these were the lowest in category of low level of commodity exchange villages and the highest in the moderate level of commodity exchange villages but the difference between the highest and the lowest value was nominal.

**IV SPATIAL PATTERN OF COMMODITY EXCHANGE: 2001**

There were wide inter-village differences in the levels of commodity exchange even in 2001 (Map 5.4). The index value ranged from a high of 98.04 in Kheri Barkesh village of Hansi-I block to a low of 41.5 in Badon Rangran village of Hisar-I block of the district. The range difference was 56.54, indicating that the village at the top had more than two-times (2.36) greater possibilities of interaction with an urban centre to sell marketable surplus or for purchasing farm inputs. Average value increased to 86.10 in 2001. On the basis of index value in commodity exchange, 272 villages have been grouped into three levels of commodity exchange by identifying the critical breaks in distribution of index values at village level.

**(a) Areas of High Commodity Exchange Level**

211 villages or more than three-fourth (77.57%) of the total villages in the study area recorded a high level of commodity exchange. These had an index value ranging from a high of 98.03 in Kheri Barkesh village of Hansi-I block to a low of 80 in Neoli Khurd village of Hisar-II block in the district. The range difference of 18.03 reveals that the village at the top differs by nearly 1.22 times from the village at the bottom, which is not a large gap. The same is supported by a coefficient of variability value of 5.43 per cent. In other words, villages falling in the category of high commodity exchange level do not differ widely in terms of commodity exchange. Instead, these have the lowest value of coefficient of variability of all the three categories.

These villages covered almost three-fourth of the total area in the eastern side of the district. These villages, falling in Alluvial Plain, had fine alluvium with fine to coarse loamy soils and developed irrigation system. These villages are also inhabited by traditionally vegetable growing castes like Sainis. In addition, these villages also had the locational advantage of being in proximity to towns. Therefore, distance from the city/town played a significant role in the supply of perishable goods like vegetables,
Map 5.4

District Hisar
Index of Commodity Exchange, 2001
(Data by Villages)

RAJASTHAN

District Fatehabad
District Jind
District Bhiwani
District Rohtak

Highest Index Value: 98.04 (Kheri Barkesh)
District Average: 86.10
Lowest Index Value: 41.50 (Badon Rangran)

Index of Commodity Exchange

Level
High
Moderate
Low

Source: District Census Handbook, Hisar (2001)
milk and milk products. Every town/city upto the distance zone of 15-20 kilometers had high commodity exchange level villages. These belts of villages merged with each other leaving one or two villages in between with moderate level of commodity exchange. This happened because these towns in the eastern part of the district arc located at an approximate distance of 20-30 kilometer from each other; thus making the district hub of high commodity exchange level villages except a strip of villages along the western border of the district.

(b) Areas of Moderate Commodity Exchange Level

56 villages or one-fifth (20.59%) of the total 272 villages in the study area were in this category. The value of index varied from a low of 60.33 in Dobeta village of Hisar-I block to a high of 79.47 in Kalirawan village of Agroha block in the district, giving a range of 19.14. The coefficient of variability value was 7.15 per cent, revealing that the inter-village variations in terms of commodity exchange were not of a high order.

Most of these villages were part of the Aeolian Plain except a few which were part of the Alluvial Plain. Distance from Hisar city and other towns was mainly responsible for their being in moderate category of commodity exchange level. Supply of the perishable products like milk, vegetables and fruits to the towns/city was not an easy job for these villages. Even after overcoming the problem of soil infertility and irrigation network after Green Revolution, these villages were not able to commercialise their agricultural practices to the higher or full extent and remained in the moderate category of commodity exchange level. Their supply of milk, vegetables and fruits was limited to the city/towns because of increased distance. Moreover, limited supply of water in the western part of the district coupled with little water holding capacity of these coarse loamy and sandy soils did not promote much commercialization of agriculture i.e. commercialization was up to a limited extent in the western part of the district.

(c) Areas of Low Commodity Exchange Level

5 villages or about 2 per cent out of the total 272 villages in the district revealed a low level of commodity exchange. The index value varied from a maximum of 58.81 in Chudhriwali village of Adampur block to a minimum of 41.5 in Badon Rangran
village of Hisar-I block in the district. The range difference was 17.31. In other words, the village at the top had an index value about 1.5 times higher than that of the village at the bottom. The coefficient of variability was 13.30 per cent. Obviously, intra-category variations in this case were higher than that in other categories in 2001 (Table 5.4).

<table>
<thead>
<tr>
<th>Level of commodity exchange</th>
<th>Average value for category</th>
<th>Standard deviation</th>
<th>Coefficient of variability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>90.58</td>
<td>4.92</td>
<td>5.43</td>
</tr>
<tr>
<td>Moderate</td>
<td>72.16</td>
<td>5.16</td>
<td>7.15</td>
</tr>
<tr>
<td>Low</td>
<td>53.16</td>
<td>7.07</td>
<td>13.30</td>
</tr>
</tbody>
</table>

These villages fell in the western and south-western parts of the district. These had lower proportion of net cultivated land because of shifting sand dunes under the effect of desert topography. Coarse loamy to sandy soils with insufficient irrigation, which mainly depended on rainfall in the monsoon season, also provided less scope for cultivation in these villages. Thus, agricultural production was just sufficient for subsistence resulting in a little surplus for commodity exchange.

Briefly, a dominant majority (around 78 per cent) of the villages fell in the high category of commodity exchange level. Commodity exchange was a feature of Alluvial Plain where fertile soil and well developed irrigation system provided the suitable conditions for agriculture. In the post Green Revolution period, proliferation of tubewell irrigation played a catalytic role in increasing the degree of agricultural commercialization and production in the district. Consequently, agricultural surplus produced in these villages promoted commodity exchange in the area. Concentration of towns/urban centres in the eastern part of the district also encouraged the commodity exchange and transformed the district into a hub of high commodity exchange level villages. On the other hand, 5 villages falling in western and south-western part of the district have subsistence agriculture due to desert topography and saline and alkaline soils. Irrigation mainly depended on rainfall. Thus, such villages failed to produce any marketable surplus to promote commodity exchange. In relative terms, intra-category
variations were the lowest in the villages with high level of commodity exchange and highest in villages with low level of commodity exchange.

SECTION-II

CHANGE IN LEVELS OF COMMODITY EXCHANGE: 1971-2001

Of the 272 villages in the district, 141 (52 per cent) or more than half of the villages recorded an upward movement, 128 or 47 per cent villages revealed no change and three villages experienced downward movement in their respective levels of commodity exchange during 1971 to 2001 (Fig. 5.1).

![District Hisar: Movement in Levels of Commodity Exchange, 1971-2001](image)

Fig. 5.1

Of the 141 villages which recorded an upward movement in their respective category levels during 1971 to 2001, a dominant majority i.e. 98 villages moved to ‘high’ from ‘moderate’ category during this period (Maps 5.5 and 5.6). Out of the remaining 43 villages, 30 moved to ‘moderate’ from ‘low’ category and the rest 13 villages directly jumped from ‘low’ to ‘high’ category of commodity exchange (Table 5.5). Around 52 per cent or more than half of the total villages registered an upward movement in their respective levels; whereas a considerable number i.e. 123 villages (45 per cent) remained in the same category of commodity exchange both in 1971 and 2001. Thus, this trend would have improved a little more regarding urban-rural interaction.
Map 5.5

District Hisar

Movement in Levels of Commodity Exchange
1971-2001
(Data by Villages)

Note: (i) Low upward movement refers to change from low to moderate or moderate to high category, whereas, high upward movement refers to change from low to high category.
(ii) Low downward movement refers to change from high to moderate or moderate to low category.
(iii) 3 villages experienced low downward movement from high to moderate category due to acquisition of land by government during 1971-2001.

Source: District Census Handbooks, Hisar (1971 & 2001)
District Hisar
Change in Levels of Commodity Exchange
1971-2001
(Data by Villages)

Source: District Census Handbooks, Hisar (1971 & 2001)
Table 5.5

District Hisar: Change in levels of commodity exchange during 1971-2001

<table>
<thead>
<tr>
<th>Level of commodity exchange</th>
<th>Number of villages</th>
<th>Change/movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>13</td>
</tr>
<tr>
<td>Moderate</td>
<td>High</td>
<td>98</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>30</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>100</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>23</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>5</td>
</tr>
<tr>
<td>High</td>
<td>Moderate</td>
<td>3</td>
</tr>
</tbody>
</table>

The 13 villages, which directly jumped to ‘high’ from ‘low’ level category of commodity exchange, recorded the highest achievement in this context. These villages were located in the west and south of Hisar city. These villages had low commodity exchange level in 1971 due to limited supply of water for irrigation facility in these villages. In 1971, the irrigated area was only 20 per cent on an average in these villages, which increased to 85 per cent on an average in 2001 (Fig. 5.2). Thus, during 1971 to 2001 these villages experienced an increase of more than four fold in the irrigation extent as a result of Green Revolution.

![District Hisar: Change in Economy of Villages, 1971-2001](image)

Out of 272 villages 98, which moved to ‘high’ from ‘moderate’ category during 1971 to 2001, were located in the vicinity of towns/urban centres like Barwala, Uklana and Hisar. The proportion of irrigated area in these villages also had a major increase.
during 1971-2001. Canal irrigation available through Bhakra and Western Yamuna Canals with their distributaries and supplemented by tubewell irrigation enabled the villagers to adopt or cultivate commercial crops in their fields. They also took to the diversification of crops towards vegetables and fruits which were required by fast growing urban population in great demand accruing the huge benefits to the farmers. Villages around the Hisar city and other towns have started growing vegetables in a big way. Hansi (rural), Depal, Dhana, Garhi, Hisar (rural), Mayyer, Raipur, Rajli, Barwala (rural), Uklana (rural), Budha Khera and Bithmara villages are significant in this context.

The area around Hansi city, irrigated by Hansi and Sunder distributaries of Western Yamuna Canal constitutes major vegetable growing belt. Kutubpur, Dhana, Garhi and Hansi (rural) villages need special mention in this context. Here, farmers of Saini caste, a caste with long tradition of vegetable growing, are found in large number. These farmers visit Sabji Mandi at Hansi to sell their vegetables. Sometimes, they sell their vegetables on contract basis while standing in the field itself. A major demand of vegetables in Hisar city and other towns is met by their surrounding villages. Among which Hisar has emerged as the largest consumer of the vegetables and fruits because of the following reasons:

(i) Hisar is the largest and fastest growing city in the district.

(ii) Being located on NH10, it is the major centre of trade and business activities in the district. It is a prosperous city with high per capita income which, in turn, leads to higher per capita consumption of quality vegetables and fruits.

(iii) Hisar city has its own vegetables, fruits and grain markets which serve as the main markets for its surrounding villages.

(iv) In other towns of the district, a substantial part of the demand for vegetables and fruits is met through production in nearby villages. But, consumption in these towns is not as large as in Hisar city. Price of the vegetables and fruits sold in Hisar city is also higher than that in other towns of the district. Surplus production of vegetables and fruits from the villages in vicinity of other towns come for sale to Hisar after fulfilling their local demand to cash the benefits of high demand in the city.
Apart from growing vegetables, villagers in the surrounding areas have also started dairy-farming to meet the milk demand of various towns of the district as well as Hisar city. Milk supply zone of Hisar city is widely spread due to large demand of milk and milk products in the city. Some of these villages are Dabra, Satrod, Ladwa, Kaimri, Mirka, Dahima, Gangwa, Guzar, Dewe, Muklan, Mirzapur, Juglan, Mater Sham, Neoli Kalan, Neoli Khurd, Chikanwas, Durjanpur, Ladwi, Landhari Sukh Lambran, Dhiranwas, Aryanagar and Bherian. Haryana Agriculture University also caters to the demand of milk in the city to some extent.

Dairy-farming has not only diversified farm activities but has also generated additional income for farmers. Moreover, the income earned through dairy-farming and vegetable cultivation is a regular source of earning to the farmers; whereas the income from cash crops is seasonal. Earlier milk selling was the profession of Gujjars but nowadays, even Jat farmers have also started selling milk due to regular earnings in this profession.

30 villages, which moved to ‘moderate’ from ‘low’ category between 1971 and 2001, are located along the western border of the district. These villages fall in the Aeolian Plain with undulating topography. Increase in proportion of irrigated land during 1971-2001 has made their upward movement possible in the levels of commodity exchange. Being located at a distance from Hisar city, having sandy and coarse loamy soils, these villages were able to make low upward movement in commodity exchange level due to increased irrigated area. Villages in this area have adopted dairy-farming and horticulture on a large scale.

On the other hand, 128 villages, which did not experience any change till 2001 in their levels of commodity exchange, had retained their previous ‘high’, ‘moderate’ and ‘low’ levels. Out of these 128 villages, 100 maintained their ‘high’ level of commodity exchange. Most of these villages were located in the east of Hisar city. Their major concentration was around Hansi town spreading in the east up to the border of the district and in the west up to Hisar city. Hansi was administrative headquarter of the district till 1832, when it was shifted to Hisar. Major blocks of these villages were Hansi-I, Hansi-II, southern parts of Barwala and Narnaund blocks and north-eastern part of Hisar-I block. Fertile land of Old Drishdawati Flood Plain and good rainfall and
irrigation network in this part was mainly responsible for high level of commodity exchange. Proportions of irrigated and cultivated land, both were high in this belt even in 1971. As a result of Green Revolution, production grew manifold in early stage. These villages also had good connectivity because of major transport routes passing through this belt. These villages took to commercialization due to increasing demand of milk, vegetables and fruits from the densely populated town of Hansi and also to meet the demand of Hisar city, which could also be fulfilled from the eastern part of the city due to fertile land and good irrigation network.

Villages, which maintained their moderate level of commodity exchange since 1971, were scattered away from the urban centres. Though increase in irrigated area was there in these villages, yet it was not up to the extent that it could change their category level.

Villages having ‘low’ level of commodity exchange both in 1971 and 2001 are a cause of worry because of their low performance. These were only 5 villages located in the western and south-western parts of the district. These villages were Chaudhrwal in Adampur block, Balsmand and Gawar villages in Hisar-II block, Badon Rangran in Hisar-I block and Risalu Khera in Agroha block. Though there was increase in irrigated area in these villages also, yet it was not sufficient. In 1971, on an average only 3.5 per cent area was irrigated, which increased to 23.3 per cent in 2001. Desert topography with sandy and coarse loamy soils coupled with insufficient irrigation was mainly responsible for low level of commodity exchange. These villages were mainly dependent on rainfall for irrigation and shifting type dunes were hindrance in cultivation in this part of the district. Agriculture was mainly of subsistence nature. Situation is showing improvement due to the effect of Desert Development Programme launched by central government and soon these villages will be out of low commodity exchange level.

Though most of the villages maintained status quo regarding the level of commodity exchange, yet registered a positive change in their index values except 3 villages. These 3 villages in the district recorded a downward movement in their respective levels of commodity exchange. These experienced downward movement from high to moderate level of commodity exchange. These were Sandlana village of
Barwala block, where land was acquired by the government for afforestation purpose; thus resulting in low cultivated area. Two other villages were Mayyer and Satrod Kalan of Hisar-I block. From these two villages, land was acquired for the military cantonment of Hisar resulting in low cultivated area. Though irrigated area increased in these villages, yet due to reduction of cultivated land due to government acquisition, these had low downward movement.

Briefly, 52 per cent of the villages in the district registered an upward movement in their respective levels of commodity exchange during 1971 to 2001. Among them, a dominant majority or around 70 per cent villages moved to ‘high’ from ‘moderate’ category and the remaining moved to ‘moderate’ from ‘low’ category and ‘low’ to ‘high’ category. Three villages in the district recorded a downward movement.

13 villages in the district directly jumped from ‘low’ to ‘high’ category recording a remarkable achievement in this context. These were located in Adampur, Agroha and Hisar-II blocks. It was due to increase in irrigated area. 98 villages, which joined high level of commodity exchange from moderate category, were mostly concentrated in the northern part of the district except the western border. The villages located in the vicinity of Barwala and Uklana towns took to commercialization and diversification due to increased irrigation and increasing demand of milk, vegetables and fruits from these newly emerged towns. Moreover, increasing hinterland of Hisar city due to its increasing supply zone for milk, vegetables and fruits because of its fast development as a satellite town of National Capital Region, Delhi provided impetus even to the far-off villages to go for commercialization and diversification.

On the other hand, the villages which joined ‘moderate’ category of commodity exchange from ‘low’ level category were concentrated along the western border of the district in Adampur, Hisar-I and Hisar-II blocks. Their movement was due to increase in irrigation extent. Though these villages were distantly located from the city and had limited irrigated area and sandy and coarse loamy soils, yet under the influence of Hisar city, these villages adopted commercialization and diversification in agriculture.

On the other hand, 47 per cent (128 villages) of the total villages did not register any change in their respective levels of commodity exchange. Out of 128, 100 villages
were in ‘high’ category of commodity exchange level since 1971, 23 were in the ‘moderate’ category and 5 maintained their ‘low level’.

Main Highlights

1) Formation of Haryana in 1966 and initiation of Green Revolution in the same time period have ushered a new era of growth in the district. With increased irrigation facility, use of hybrid seeds, chemical fertilizers and adoption of scientific methods of farming; the yield has increased manifold. Now, the district is one of the intensively cultivated areas for cotton and wheat on commercial scale and ranked at 2nd and 3rd places respectively in the state. Increased production has led to intensification, commercialization and diversification of agricultural activities. There is shift towards growing of horticulture crops (fruits, vegetables, flowers, medicinal plants, spices, strawberry and mushroom) due to huge benefits. Dairy-farming has been adopted by the people on commercial scale to a large extent due to increased consumption of milk and milk products in urban centres. Poultry-farming and fish-farming are also being adopted in the district. Developing rural economy has established both forward and backward linkages with urban centres.

2) Increased agricultural production resulted in industrialization. Development of agro-based industries and new ancillary industries took place in the district. Most of the industries in the district are located at Hisar making it a major centre of commodity exchange. Hansi is also a prominent centre in terms of commodity exchange. Various urban (Hisar, Hansi, Barwala, Uklana and Narnaund) and rural service centres (Adampur, Agroha, balsamand and Pabra) promote commodity exchange in the district.

3) In 1971, 103 villages recorded ‘high’ level of commodity exchange. Most of these villages were located in the Old Alluvial Plain around Hansi, it being the most densely populated town of the district, where commercialization and diversification of agriculture took place at an early stage because of fertile soils of Drishavati Flood Plain and high consumption levels. Vegetable and fruit growing caste, Saini, is resident in most of these villages. Hansi (rural), Kutubpur, Depal and Dhana villages are known for vegetable and fruit...
cultivation in this area. Increased milk consumption gave rise to dairy-farming.

48 villages come under ‘low’ level category of commodity exchange, which are a part of the Aeolian Plain. Shifting sand dunes, bhur or coarse loamy soil, inadequate irrigation and low connectivity are responsible for low level of commodity exchange. Effect of desertification in the western part of the district was also responsible for their being in low category. Intra-category variations were the lowest in the villages with ‘high’ level of commodity exchange and the highest in the villages with ‘low’ level of commodity exchange.

4) In 1981, 56 villages were added to the ‘high’ level category taking the number of villages to 58 per cent. Around urban centres and east of Hisar city, commercialization and diversification of agricultural activities happened to supply milk, vegetables, fruits and foodgrains. Good road network and concentration of urban centres, fertile soil of alluvial plain and adequate irrigation were responsible for diversification of agriculture. Desert Development Programme also helped the villages in the western part of the district to come out of low category. In 1981, there were 19 villages in ‘low’ category. Location in Aeolian Plain, shifting sand dunes and inadequate irrigation were responsible for their being in low category. Intra-category variations were same as in 1971.

5) In 1991, 197 villages (72 per cent) were in the category of ‘high’ level of commodity exchange or 48 more villages were added to this category as compared to 1981. High level of commodity exchange was a feature of the Alluvial Plain. Dairying became a profession of even far-off villages surrounding Hisar city, other urban centres and even in the western part of the district. It happened because of increasing supply of milk, vegetables and fruits to the Hisar city, it being a satellite town of National Capital Region of Delhi. Under the impact of Drip and Sprinkler irrigation in the western part of the district, villages in this part of the district were included in moderate category because of dairy-farming and cultivation of fruits and vegetables. Only 7 villages were left in ‘low’ category level. These were in the areas of shifting sand dunes and inadequate irrigation. Intra-category variations were the lowest
in low level category of commodity exchange and the highest in moderate level category of commodity exchange.

6) In 2001, more than three-fourth of the total villages recorded ‘high’ level of commodity exchange. These were feature of the Alluvial Plain. In most of these villages, vegetables were grown. Surrounding every town up to 15-20 kms., there was high commodity exchange belt. These belts merged and the eastern part of the district became a hub of villages with high commodity exchange level. There were one-fifth of the total villages in ‘moderate’ category located in Alluvial and Aeolian Plains. Only 5 villages were in ‘low’ level category of commodity exchange in the western and south-western parts of the district because of inadequate irrigation facility and sandy soils. Intra-category variations were the lowest in high level of commodity exchange and the highest in low level of commodity exchange.

7) More than half of the villages registered an upward movement and 47 villages revealed no change in their respective levels of commodity exchange; whereas 3 villages recorded downward movement. Upward movement was due to increase in irrigation facility and resultant commercialization of agriculture and diversification of economy in these villages. Villages, which maintained their category levels, there was increase in irrigation in these villages also. In most of the cases, these villages were already in high category even in 1971. 98 villages maintained their ‘high’ level category. Increase was due to expanding supply zone of Hisar city for vegetables, fruits and milk and increase in consumption of other urban centres also. Hisar emerged as the largest consumer because of fast development as a satellite town of NCR, Delhi. Villages moved to the ‘moderate’ level from ‘low’ level category in the western part of the district because of increase in irrigation facility. 5 villages maintained their ‘low’ level category. Downward movement was due to acquisition of land from three villages by the government resulting in reduction of cultivated area in these villages leading to less commodity exchange.