CHAPTER III

IMPACT ON MORPHOLOGY

3.0.0 Introduction
3.1.0 Morphological Development of Davangere
3.2.0 Morphological Development of Harihar
3.3.0 Labour Force and Houses
3.4.0 Urban Landuse Dynamics
3.4.1 Landuse of Davangere
3.4.2 Landuse of Harihar
3.5.0 Land Values
3.6.0 Villages within the Study Region.
The origin of a city is "diverse and complex" in which both functional as well as environmental factors work conjointly in the origin of any pre-urban nucleus at a particular place. In fixing the pre-urban nucleus, 'conditions of the site' play an important part, while in the subsequent stage of growth 'situation' is more important. The site is a controlling factor, the importance of which towns share with villages but situation is particularly an urban attribute.

The urban centres generally came into existence from rural landscape and therefore, it has rightly been called by many scholars that the towns are outcome of the villages. The establishments of industries, with their planned settlements, are expected to give rise to some changes in the morphology. By and large, a great change is noticed in the number and composition of population. But it took decades for society and culture to be affected by the influence of the non-aboriginal people and the new way of life. As large scale industries grew with the pressure of growing population,
the city or town expanded by degrees. All the old remnants of the rural landscape were obliterated by the expansion of the city and its urbanisation with industrialization. Such changes enable us to assess the impact of industrialization on urban growth and villages around it.

Nearly a century ago Davangere and Harihar were small villages. Due to natural advantages of environment, people were attracted in setting here and some of them have established commercial units after Independence. The inscriptions found in the city, denote that the region has developed since the 18th century. In those days, the area of Davangere was about 1 Sq. Kms. Harihar was only a centre of pilgrimage during that time. Hence, there was no rapid physical expansion as is found in Davangere. Presently, as a result of establishment of various industries in the twin towns, its impact on morphological development can be identified. The morphological development underwent a revolutionary change within a short time. The urban construction shadows the older pattern in such a way that even its last remnants are eclipsed in these industrial towns.

It is interesting to investigate the impact of industries on the nature and amount of morphological developments of the twin towns. The present study has been dealt with the following aspects:
1. The evolution and change of morphological expansion.
2. Study of landuse and its dynamics in relation to industries.
3. Industrial impact on land values.
4. Some of the case studies - impact on rural morphology.

3.1.0 Morphological Development

The historical study of Davangere reveals that the origin of the city goes back to some remote time. But actual morphological development has been taken from 1940. The urban planning innovations and diffusion of these aspects have played an important role in the morphological development of Davangere. These innovations in the urban development of the city can be identified in the recent extension areas. This morphological change coincides with the economic base of industrial activities. The morphological expansion of the city can be classified into four phases: (Fig. 1 and 2).

i) Development before 1940 - Slow
ii) Development between 1941-50 - Normal
iii) Development between 1951-61 - Rapid
iv) Development from 1961 onwards - Very rapid.

From 1901 to 1920, the city had not noticed any remarkable growth in respect of industries, residential
DAVANGERE
MORPHOLOGICAL DEVELOPMENT

INDEX

1  BEFORE 1940
2  1941-50
3  1951-60
4  1961-70
5  1971 ONWARDS
Fig: 2
BASE MAP OF DAVANGERE

INDEX

1. BUS STAND
2. RAILWAY STATION
3. DEPUTY SUPERINTENDENT POLICE OFFICE
4. GENERAL HOSPITAL
5. MEDICAL COLLEGE
6. D.R.M. COLLEGE
7. ENGINEER COLLEGE
8. POLYTECHNIC COLLEGE
9. ARTS AND CRAFT SCHOOL
10. REGULATED MARKET
11. MARKET AREA

INDEX

320 640 960 MTS
and other functional zones. This was due to inadequate facilities for economic activities. At this time, commercial activities fairly played their role in the occupational structure along with agricultural activities of the people. During subsequent decades the commercial activities were intensified. As a result good number of godowns, office buildings, and houses were constructed by the merchants for the purpose of trade in the city. Such a nature of function helped to push the city boundary towards the south of the railway line. The area of town was increased from 2.15 Sq.Kms. to 6.8 Sq. Kms. in 1920. Meanwhile, ginning, oil mills and handloom charakhas were established without any proper planning. As a result of it a good number of slums were created in the city.

The existence of efficient and organised markets and industries has stimulated the growth of towns by generating other economic functions, such as, transport agencies, servicing centres etc. The commercial areas were started to locate in the central part of the city. All these functions were relatively related to agricultural productions of the surrounding region.

The morphological expansion of Davangere upto 1940 was very slow. Due to these activities development took place. During this period sixteen industries, twelve educational institutions and other government offices were
established (Table - 1). This necessitated the municipal office to cover the industrial areas, and it added to the physical expansion of the city. The area reached 8.2 Sq. Kms. with a population of 31,759 and the number of houses were also raised from 2159 in 1911 to 7165 in 1941.

Table - 1

MORPHOLOGICAL DEVELOPMENT OF DAVANGERE

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tbody>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1911</td>
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<td>-</td>
<td>1</td>
<td>2159</td>
<td>10574</td>
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<td>-</td>
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<td>3155</td>
<td>16371</td>
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</tr>
<tr>
<td>1931</td>
<td>-</td>
<td>800</td>
<td>6</td>
<td>6255</td>
<td>23155</td>
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</tr>
<tr>
<td>1941</td>
<td>16</td>
<td>2900</td>
<td>12</td>
<td>7165</td>
<td>31259</td>
<td>8.2</td>
</tr>
<tr>
<td>1951</td>
<td>45</td>
<td>5200</td>
<td>22</td>
<td>10823</td>
<td>56018</td>
<td>10.78</td>
</tr>
<tr>
<td>1961</td>
<td>77</td>
<td>7300</td>
<td>40</td>
<td>14558</td>
<td>78242</td>
<td>15.68</td>
</tr>
<tr>
<td>1971</td>
<td>130</td>
<td>8500</td>
<td>69</td>
<td>15200</td>
<td>121110</td>
<td>18.64</td>
</tr>
<tr>
<td>G. Total</td>
<td>130</td>
<td>8500</td>
<td>69</td>
<td>15200</td>
<td>121110</td>
<td>19.42</td>
</tr>
</tbody>
</table>

Source: Municipal office, Davangere and Industrial Directory.
Normal development took place during 1940-50. The township underwent a spatial expansion towards the southern side and along the railway line, due to establishment of industrial areas and transport facilities. A considerable growth in population, residential houses and industries took place. The total area of the city rose to 10.78 Sq.Kms, with a population of 56018 and number of houses increased to 10823. Meanwhile the D.R.M. College (1946) and D.R.R. Technical College* (1949) were established in the Northern side of the city. During 1948-1950, Government Colleges and labour quarters were fully developed. As a result of establishment of educational institutions and various industries in the city, the Katte Jambanna Extension, P.J. extension, Shivaji Nagar, Railway quarters were fully developed (Photo). The names of the streets and extensions highlight the ethnic composition of extension areas. At the end of 1950, the town was equally extended towards the north and south. The railway line separates the town into two parts i.e. old township and new township. These two parts have their special characters in spatial structure. In the new township modern architecture and designs are found with proper urban amenities. These are not found in the morphology of the old township. Meanwhile

* D.R.M. College = Dharma Ratnakar Rajanalli Muddurappa College.

D.R.R. Technical College = Dharma Pravartaka Rajanahalli Ramashresti Polytechnic College.
the number of industries rose to forty-five. Out of them, large scale textiles, oil mills were shared to a larger extent. As they required larger area for factory site, they occupied a vast area in the old extension part.

The third phase i.e. 1951-60; During this period rapid physical expansion took place in the city due to the establishment and development of various industries and educational institutions etc. Industrial skilled workers and other people began to construct their own buildings along the border area of the existing quarters and very near to the industries. Such an unplanned development of colonies of industrial workers became the slum areas of the city. The establishment of Bapuji College (1955), The B.D.T. Engineering College * (1951) and the D.R.R. Training College and a number of industries in the south and south-east of the city helped physical expansion. Jambanna Nagar, Bharati Colony, Shekappa Nagar and labour colony, etc, were fully developed. The commercial areas such as Kaipete, Bamboo Bazar, and Mandipete were encircled the development of Morphology by establishing godowns, show rooms, offices, etc, in the older part of the city where present central market is located (Photos 7-8).

* B.D.T. Engineering College = Brahmappa Devendrappa Tavappanavar, Engineering College.
D.R.R. Training College = Dharma Ratuakar Rajanahalli Training College.
The number of houses increased to 14558 with a population of 78124. As a result of this, the city boundary extended beyond the Annakonda Village. This changed the rural metrics of this village into an urban complex. In the extension areas houses were built apart from each other with sufficient compound and good ventilations. The particular impact of the industries and commerce is identified in these areas. The authors' survey reveals that most of the industrial owners, highly skilled workers and merchants have settled in this new township. They constructed beautiful buildings on modern lines. Meanwhile the number of industries grew from 45 to 77 and other small industries account for about 170 units. Most of these are located in Azad Colony. Due to this, industrial estates were allotted on the southern side and the total area of the municipality increased to 18.64 Sq. Kms. Such planned development gave scope for network of roads, communications, sewage systems, etc. The increase of specialised industries brought out this city into existence as an economic convenience and detached them completely from their rural characteristics where villages were influenced by this township.

From 1961 to 1970 the change of activity is seen in Davangere. Since 1960 industries and commercial activities were further developed in the city. Many higher educational institutions were established, namely, the Teachers training
school (1961), The Craft and Arts School (1964), the J.J. M. Medical College (1965), the A.V.K. Women's College (1967), the R.L. Law College (1968), the M.S.B. Evening Law College (1969), the M.M. College of Education (1970), the A.R.G. Arts & Commerce College* (1973). These were facilitated with planned gardens and playgrounds (Photo-2). These areas were named Vinoba Nagar, M.C.C. Colony, C.H.B. Colony, K.H.B. Colony, in the south of the city.

After 1971, the physical expansion was beyond the control of the municipality. During this period the Arts and Crafts school, hostels for the medical college, engineering college, and other colleges, swimming ponds, along the Shabanur road in the south west of the city and the regulated market, fully occupied a considerable area on the eastern side of the city and very near the industrial estates. Recently, some of the industries constructed huge buildings outside the municipal boundary, namely, Yalamma Cotton and Wool and Silk Mill, Anjaneya Mills and other engineering units. Well planned colonies are being constructed by the

* J.J.M. Medical College = Jagadguru Jayadev Murugha Rajendra Medical College.
A.V.K. Women College = Ajjampur Virupaeksha Kamalamma Women College.
R.L. Law College = Rajanahalli Laxmanappa Law College.
M.S.B. Evening Law College = Maknur Sarvamangalamma Basappa Evening Law College.
M.M.B.Ed. College = Maknur Malleshappa College of Education.
housing boards and societies. These are named after - Devaraj Urs (Fig. 3) and Chikkanmani Colonies.

3.2.0 Morphological Development of Harihar

The morphology of Harihar town has not abruptly changed like Davangere. This is because, Harihar has only large scale industries. The physical expansion of the towns is due to those industries. The industrial impact can be seen on day-to-day economy of the town as well as on morphology. The development of morphology can be classified into five phases (Fig. 4 & 5).

i) Before 1940
ii) 1941 - 1950
iii) 1951 - 1960
iv) 1961 - 1971
v) 1971 onwards.

Harihar has a rich historical heritage belonging to the 12th century. It was governed by the Pandyas and later by Vijayanagar kings. The town claims Mythological heritage and it belongs to Guheshwar a giant. Even today, the town has a beautiful Harihareshwar temple with a four feet idol in a standing posture (Photo-‘x’). Till, the opening of Mysore Kirloskar Ltd., in 1941, the town was a centre of pilgrimage, and since then it has become an important town.
Fig. 4

HARIHAR
MORPHOLOGICAL DEVELOPMENT
Fig 5: BASE MAP OF HARIHAR TOWN

INDEX
1. POONA BANGALORE ROAD
2. BRIMAPURA ROAD
3. TEMPLE ROAD
4. SHIMOGA ROAD
9. BUS STAND

- 24 0 24 40 72 MILES

- 5. BAZAR ROAD
6. HOSPET ROAD
7. HARIKARESHWARA TEMPLE
8. STATION ROAD
10. RAILWAY STATION

BAD BOUNDARY
in industrial as well as religious activities. The remarkable growth of economic functions was not noticed in the town except the religious activities. Due to the location of the Harihareshwar temple, the slow development of morphology was seen. During this period tourists and other floating population were predominant.

The opening of Mysore Kirloskar Ltd. in 1941 and other ancillary industries have changed the nature of the town. The factory site was selected beyond the town's area in the north. During subsequent period many labour quarters were constructed by this unit to the northeast of the town along the Harapanahalli road. In addition to this, some labour colonies near Brahampur localities came into existence. These colonies have came up without proper plans. This type of development has created a slum atmosphere in the town (Photo). As a result of this development the labour force, the number of houses, and area have increased to a considerable extent (Table - 2).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Population</th>
<th>Labour population</th>
<th>Houses</th>
<th>Area in Sq.Kms.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>6884</td>
<td>45</td>
<td>1018</td>
<td>2.2</td>
</tr>
<tr>
<td>1941</td>
<td>8422</td>
<td>2728</td>
<td>2287</td>
<td>5.0</td>
</tr>
<tr>
<td>1951</td>
<td>15920</td>
<td>2936</td>
<td>2960</td>
<td>5.7</td>
</tr>
<tr>
<td>1961</td>
<td>22829</td>
<td>3377</td>
<td>4012</td>
<td>6.3</td>
</tr>
<tr>
<td>onwards</td>
<td>33888</td>
<td>4539</td>
<td>5302</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Source: Municipal Office, Harihar.
During the subsequent decade i.e., 1951 to 1960, the Bharat Mill, the R.C. industry, rice mills, saw mills and various ancillary industrial units were established. Due to development of these industries labour population also increased considerably (Table - 2). During this period quarters of Karnataka State Electricity Board P.W.D., labour quarters and travellers Bungalow, Guest house of factories were constructed at different localities.

Between 1961 and 1970, physical expansion took place on southern side of the town due to the establishment of various educational institutions, hospitals, banks, etc. The vast area was occupied by a Tailoring school, Urdu School, Tamil School, and hospitals. In addition to this, some more labour quarters of Kirloskar factory were constructed to south east of the town.

After 1970, many government offices like taluka head­quarters, T.D.B. and recreational facilities like parks, and play grounds were constructed in the extension area. The vacant land within the town was converted for various purposes such as residential, commercial, public and semi-public, play grounds and parks.

The Harihar Polyfibre Industrial unit, which is located outside the municipal boundary, is completely linked with Harihar town in its activities. It has helped to cover the
area with housing colonies on north east of the town. Due to development of various industries, the population shot to 33,888 with 5302 houses. As a result of it the total area of the town has increased to an extent of 7.7 Sq. Kms.

The above analysis reveals that during 1941 to 1950 and 1971 onwards, a considerable change in morphology, population, houses, and other urban amenities is found. This is because of the establishment of Kirloskar factory in 1941 and Harihar Polyfibre factory in 1971. To feed the major industries many ancillary industries were established. This has changed Harihar from pilgrimage town to an industrial centre in Chitradurg district in Karnataka.

3.3.0 Testing the Relationship between Labour Force and Number of Houses

To test the relationship between the labour population and number of houses in both the units, which are the major aspects in expansion of twin towns, the product moment correlation coefficient technique has been worked out. The data is taken from Table No. 1 and 2.

\[ r = \frac{\text{Covariance of data sets } x \text{ and } y \text{ taken in pairs}}{\text{Standard deviation of data set } x \text{ multiplied by standard deviation of data set } y} \]

or in statistical short hand.
\[ r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum x^2 \cdot \sum y^2}} \]

Where \( r \) = relation \( x \) = labour population \( y \) = houses
\( n \) = number of decades.

1) Davangere

\[ r = \frac{10634960}{2814 \times 4693} \]
\[ r = 0.66 \]

2) Harihar

\[ r = \frac{1796490}{1687.2 \times 1464.5} \]
\[ r = 0.72 \]

According to the computed value of both units, there is a high degree of association between the industrial workers and the number of houses in Davangere and Harihar.

The same relationship has also been tested with the help of Lorenz curve. The diagram shows that the points run along the 'Trace line' in the case of Davangere and Harihar. This exhibits a high degree of correlation between labour population and the number of houses in the twin towns during different decades (Fig. 6).
LORENZ CURVES

LABOUR POPULATION - GROWTH OF HOUSES
RELATIONSHIPS

DAVANGERE

HARIHAR
3.4.0 Urban landuse Dynamics

A city's spatial structure tends to follow definite patterns modified by local geographic and cultural conditions. The study of spatial use is described in terms of physical forms and arrangements of the space and buildings, that compose the urban landscape or townscape as it may be called. The last two decades have witnessed some visible changes in Davangere and Harihar in respect of their morphology and functions. In an attempt to explain the dynamism and the functional zones of towns a number of urban geographers have advanced theories of urban growth and functional development. The urban landuse theories developed by Burges (concentric theory, 1925 and 1929), Hoytes (sector theory, 1939) and Harris and Ullman's (multiple nuclei, 1945) depict the specific type of urban landuse growth. Testing of the above theories to Indian cities is not correctly applicable. Because this type of development is not found in any Indian urban centres. But recently Karriel and Karriel (1972) have developed a "composite theory" which signifies the growth of urban landuse in combination with the above pattern of landuse theories. In the case of Davangere and Harihar "the composite theory" holds good for the urban morphological growth.

The study of landuse pattern and its quantitative as well as qualitative analysis helps in understanding the
functional nature of the town. The landuse/industrial town is usually not of the normal extensive land areas remain under industrial activities. The urban centres in a particular economic and cultural system have the same general characteristics. All their parts or functional areas share a relatively fixed proportion of the total area of each city.

3.4.1 Landuse of Davangere

As an industrial city, Davangere shows a particular features in morphology. The landuse pattern of Davangere unit shows that various functional regions have grown during the course of its historical development. Certain elements in this structure have emerged in the years since the growth of industries. The preceding analysis reveals the functional pattern of Davangere. The Table - 3 depicts the spatial distribution of various functions of Davangere.
Table - 3

LAND USE OF DAVANGERE

<table>
<thead>
<tr>
<th>Name of Landuse</th>
<th>Area in Hectare</th>
<th>% to the Developed Area</th>
<th>% to the Total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>297</td>
<td>37.74</td>
<td>15.54</td>
</tr>
<tr>
<td>Commercial</td>
<td>65</td>
<td>8.26</td>
<td>3.40</td>
</tr>
<tr>
<td>Industrial</td>
<td>118</td>
<td>15.99</td>
<td>6.17</td>
</tr>
<tr>
<td>Public &amp; Semi Public</td>
<td>90</td>
<td>11.43</td>
<td>4.71</td>
</tr>
<tr>
<td>Parks &amp; Open Space</td>
<td>41</td>
<td>5.12</td>
<td>2.14</td>
</tr>
<tr>
<td>Roads &amp; Streets</td>
<td>112</td>
<td>14.23</td>
<td>5.96</td>
</tr>
<tr>
<td>Utility and Others</td>
<td>64</td>
<td>8.13</td>
<td>3.37</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>787</strong></td>
<td><strong>100.00</strong></td>
<td><strong>41.29</strong></td>
</tr>
<tr>
<td>Agricultural</td>
<td>1124</td>
<td>-</td>
<td>58.81</td>
</tr>
<tr>
<td>Grand Total</td>
<td>1911</td>
<td>-</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Town Planning Office, Davangere.

Out of the total area, (19.42 Sq.Kms.), the developed area is 7.87 Sq. Kms. Beyond the municipal boundary, the area has been developed by civilians for various purposes such as industrial, residential and other uses. This shows an uncontrolled and haphazard growth within and outside the city boundary (Fig. 7).

The industrial use is second to the residential use and it accounts for 15.99 per cent of the developed area.
LAND USE MAP OF DAVANGERE

INDEX

- RESIDENCE
- TRANSPORT
- OPENSPACE
- PUBLIC & SEMIPUBLIC
- COMMERCE
- INDUSTRY
- AGRICULTURE
- UTILITY
During the last three decades, the city has developed rapidly in morphological, social, economic, and other urban amenities. These have contributed to the aggregation or segregation or even sporadic growth of various functions of the city. In dealing with the functional analysis of the landuse, the area has been classified as in Table - 3. The industrial belt, commercial area, residential quarters, social and public institutions, parks and open spaces and the like constitute the major parts of the town scape. The above uses have been dealt in greater detail:

Residential Use

The total area under this purpose is 37.74 per cent of the developed area. The residential area is distributed in two units of city area: (i) old town (ii) new town. The railway line divides the city into old and new town. After the construction of the railway line, the highway and the trade routes, several industrial estates and other institutions have influenced a lot on the settlement pattern. This is particularly found between old and new townships. In addition to industrial growth, educational and tertiary activities, have attracted a large number of people to the city. As a result of this, new extension areas have developed along the periphery of the city. Such a complex nature with small scale and medium scale industries makes it very difficult
to recognise unifunctional areas in most of the residential areas. This leads to a change in the landuse pattern according to demand and situation. This can be seen in the Ahmed nagar, Regulated market area, Mandipete and the Central part of the city. In these old residential areas, the buildings have been used for the purpose of commerce, godowns, show rooms and even lodgings. Due to a great rush and high demand, old buildings in the core of the city, were replaced with modern and fashionable buildings with many storeys. As a result of this, vertical expansion is being taken in the older areas. This clearly depicts the landuse dynamism in residential areas in Davangere. With urban housing, it is important to realise that the type of housing characteristics of a given locational setting in the city may change with the passage of time, i.e., the locational pattern is dynamic.

Residential areas, perhaps more than other landuse zones, are dynamic and subject to change. Some changes are physical in nature, especially structural changes in the dwellings in residential areas. The commercial activities in the residential areas make a city into a dynamic one. The former residential houses have been replaced for purely commercial purposes. In some cases, along the main roads or heavy densely populated area, the front portion of the houses is used for commerce and even industries parched rice mills and the rear portion for residential use. It is common
to find a shop on the ground floor and residence on the first and upper floors. Due to the old type of houses and the concentration of labour population, slums are predominant in almost all the older residential areas. The best example of slum creation is in Azad colony and Indira Nagar, where 150 to 200 Mandakki bhatties (Parched rice Mills) are located in these localities (Photos 14-15).

The increase in permanent residents is not due to the current housing shortage but to many other factors like improvement in transport, market facilities, communications, radio and recreation facilities and in the succession of residential areas, numerous factors characterized each stage in the succession process. The expansion of residential area has been very rapid towards the north and southwest of the core of the city. Such development of residential areas has been influenced by the location of various industries, namely, the Anjaneya Mill, Yallamma textile, engineering units, rice mills, etc. The extension of the municipal limits in 1958 has been dissipated by the village panchayats such as Nitapalli, Shabanur and Annekonda villages. As the population increased and expanded in areal dimensions, much of agricultural land and open space has now come under residential use. The extension area has been occupied by industrial owners, merchants, teachers and professors. They have built better houses with beautiful gardens and with
proper sanitation on modern lines. New colonies with modern amenities are the Azad colony, the K.B. extension, the H.C. colony, the Islampeth, the church extension, the labour colony, the medical college, and the engineering college areas. Structure used for the construction of houses is on modern lines with all amenities of an urban character (Photo-12).

In general the residential areas developed after the establishment of textile, oil mills and other industries. In these colonies, houses have been constructed by housing societies*. There are a good number of congested and unplanned areas developed individually.

Commercial Use

The area under this use accounts for about 65. (8.26%) hectares. Improved irrigation facilities have helped to flourish commercial activities. The city is not only situated on the main trade route, but also has a number of market oriented goods produced in the surrounding region. As a result of it, commercial activities have developed tremendously.

* More than thirteen housing societies are working in the twin towns and out of them six are concerned with industries (See appendix III-1).
The wholesale market for groundnut, cotton, rice and other oil seeds, etc., is situated in and around the Kaipete, Dalal market (Commission agents) and regulated market. The regulated market occupied 18 hectares of land in the city. There are about 172 big commission agents dealing with various types of goods. They have occupied about 19.8 hectares of land in these commercial streets.

Since the establishment of various industries the C.B.D. of Davangere has shown a fast expansion in its size. There are several shops mingled with specialised shops like silver, gold, cloth, bronze pots, and medicines. Several Banks, typing institutions, vegetable markets are also established in this area.

The Madipete, Chikpete, Vakkaligara pete are famous for retail and whole trade in cloth, oil, cotton, groundnut, etc. Every shop has allotted some portion for show rooms for local products of various types of manufactured goods. As a result of this, many residential buildings, in the market centre, have been converted into modern big shops. The number of 3 or 4 storeys has been increased from two to four during the last fifteen years. The reason for this is the scarcity of land and concentration of other market facilities in this area only. The vertical expansion has been caused as a result of high demand in the market areas. Secondly, much axial growth of market area has taken place
along the main roads especially in the direction of regulated markets.

Garages are distributed from the bus stand to Devaraj colony and engineering workshops are beyond it. Big workshops are located on the Mahatma Gandhi Road and the Shivaji Road. The industrial products of Harihar such as lathes, agricultural implements are also sold in this part. Besides commercial activities, the market centre has in recent years, attracted several banks, and other societies in view of the increased financial activities in the city by industrialists and business men. These have occupied a good space and are located in the storied buildings in this area.

**Industrial Use**

Out of the total developed area industries occupy 118 hectares of land or 15.99 per cent of the developed area. From the point of view of spatial distribution, the industries of Davangere can be grouped in two distinct categories, unplanned locations and planned industrial sectors. The former relate to small scale enterprises oriented either to the raw materials from regional sources, or to the local needs of the city. The planned industrial zones, on the other hand, have large scale and medium industries which have developed along the periphery and outside the city municipal boundary (Fig. 7).
Small scale industries are distributed haphazardly in Davangere. They have grown without any pattern as there was no planning or control over their location in the urban area. Small industries are located in the residential, commercial, and even in the educational areas. In the early period, they were established on the urban fringe. With the subsequent physical expansion of the city, they became engulfed in the main residential areas. During day time houses have the appearance of factories, but at the night they are used for the domestic purpose. There should be decentralization of industries so as to provide an easy accessibility to one and all. From the point of view of healthy atmosphere, the present industries which are located in residential areas should be shifted to the industrial estates.

The planned industrial areas are concentrated in the North and South east and North west of the city. This pattern of industrial landuse in three main recognisable sectors is a very broad generalization and must be broken-up into greater detail before it can be understood in terms of industrial planning. The area under large scale and medium scale industries is about 90 hectares and the rest is occupied by the small scale industries.
Public and Semi Public Uses

The area devoted for this purpose is about 90 hectares of land or 11.43 per cent of the developed area. There is heavy concentration of public and semipublic use in the civil area rather than in the market area. Even though Davangere is an administratively taluka head quarter, it has a good number of primary schools (46), high schools (19), colleges (9), Technical institutions (5), engineering, medical, craft school, etc., trade and labour unions (12), banks (25), and hospitals (21). In addition to these there are many district level offices like, the magistrate court, the civil court, trade associations and a labour commission. This itself exhibits the importance of the area in the city under public and semipublic use. Most of these institutions are situated in the extension area. This type of development under public and semipublic use is mainly the impact of various industries and population growth.

Parks and Open Space

The area devoted for parks and open space is very significant. The area used for this purpose is about 41 hectares. There are many parks in the city - namely the Municipal park, the Shivaji park, the Vinoba park and the Vishweshwaraya park (photo*). Davangere being a class I city and industrial

* Figure based on field work - 1977.
22. Model House (House of Industrial Owners)

23. Municipal Park

24. Visheshwaryya Park
centre of Karnataka state it should have more beautiful parks with modern amenities. Some more parks and garden for children and for adults should be constructed at various places. The city should be a place not only for work but also for comfortable living with all facilities for recreation and the like.

**Roads and Streets**

The area used for this purpose is about 112 hectares or 14.23 per cent of the developed area. The area covered by roads and streets is proportionately much less, when it is compared with the total area of the city. This is because the roads and streets are generally very narrow in the older part of the city. Of the total area under this use about 80 per cent is found in the extension areas, where industrial and educational institutions have come up. Higher concentration under this head is mainly due to the location of various industries in the extension areas where proper planning orientation is observed strictly by the town planning unit as well as industrial owners.

In addition to the above functional zones, area under utility services and other uses is about sixty four hectares. Utility service is usually maintained for throwing rubbish and
night soil, water reservoirs, sanitation and municipal market yards, etc.

3.4.2 Landuse of Harihar (Fig. 8)

Residential

The residential land comprises a greater share of the developed area in the town than any other single landuse type, it covers an area of 198 hectares of land. The type of housing characteristics of a given locational setting in Harihar has changed with the passage of time. The spatial distribution of residential area is very haphazard. The residential areas

Table - 4

<table>
<thead>
<tr>
<th>Types</th>
<th>Area in % to the developed area</th>
<th>% Total area</th>
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</thead>
<tbody>
<tr>
<td>Residential</td>
<td>38.65</td>
<td>25.71</td>
</tr>
<tr>
<td>Commercial</td>
<td>6.26</td>
<td>4.15</td>
</tr>
<tr>
<td>Industrial*</td>
<td>19.35</td>
<td>12.86</td>
</tr>
<tr>
<td>Public &amp; Semi-Public</td>
<td>15.82</td>
<td>10.51</td>
</tr>
<tr>
<td>Parks &amp; Open space</td>
<td>8.01</td>
<td>5.32</td>
</tr>
<tr>
<td>Roads &amp; Streets</td>
<td>8.11</td>
<td>7.92</td>
</tr>
<tr>
<td>Utility &amp; Others</td>
<td>3.80</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>66.47</td>
</tr>
</tbody>
</table>

Source : Town Planning Office, Davangere.

* Area of the Harihar Polyfibre factory is not included as it is located outside the municipal jurisdiction. But functionally it is solly linked with Harihar town only.
LAND USE MAP OF HARIHAR TOWN

INDEX

- RESIDENCE
- TRANSPORT
- OPENSPACE
- COMMERCIAL
- INDUSTRY
- AGRICULTURE
- PUBLIC & SEMIPUBLIC

Fig: 8
have come up towards northern side of the town. This
development has taken place due to the location of Kirloskar
factory. The first node of the residential expansion was in
close proximity to the market centre. The early development
took place around the Harihareshwar temple.

After 1951, the residential areas came into existence
towards the south eastern part. As the labour population
increased with time, residential sites were developed to
accommodate the additional inhabitants. Some of this expansion
of residential areas came in the form of areal expansion of the
already established concentric zone around the commercial
centre of the town.

The residential areas of the town are extended in a
very unplanned manner. The shape of Harihar has been changed
much with the establishment of the Kirloskar, polyfibre and
other industries from the point of residential areas.

The residential areas consist of two distinct types of
development (1) the old unplanned development and (2) the new
planned residential areas (photo*).

The section around Harihareshwar temple and market area
have remained a favourite residential locality. The general
tendency of people is to live near their place of work and
within walkable distance. It has caused an overcrowding of
houses in the town proper. Majority of houses, lying west and south of Brahmapuri, are in a dilapidated condition. Presently these old type of buildings are the greatest problems of the town. The rest of the residential area of the old town exhibits a bad picture to the visitors. The Naduvala pete (middle market), and Kurubara wadi, have sprung up within the congested areas.

A large number of industrial workers are not able to get quarters. Hence they stay in the older part of the town. The workers of Kirloskar, Polyfibre and other skilled workers have built their own houses in the new extension areas. A.K.Colony, Harlapur extension, railway colonies, etc., have more open space than the older part of the town (photos).

The urban structure of Harihar in the outer zone with several planned residential colonies and housing schemes presents an aspect similar to that of a modern city. Morphologically Maratha area with separate Bungalows is quite distinct from the local people. This highlights the concentration of ethnic groups of Maratha community, who are well to do and established in their own colonies with modern amenities. These are mostly the owners of factory and high salaried people. This new township is devoted to industrial activities. As a result of this, the area of Harihar has been doubled from the original.

Of the residential buildings, 56 percent of the buildings
are ordinary 32 percent fair and only 12 percent are in good conditions.

**Industrial Use**

The fig. 8 reveals that quite a significant part of the municipal area of Harihar is under industrial activities. Of the total developed area, industries have occupied 99 hectares or 19.35 percent of the developed area.

From point of view of spatial distribution, the industries of Harihar can be grouped into two distinct categories. Planned locations and unplanned sectors. The former relates to the small scale industries (puvva, flour mills and Bakeries) oriented to raw materials from local sources. The planned industrial sectors on the other hand, have large and medium scale factories which have developed on the periphery and extension areas of the town.

The area under Mysore Kirloskar, Hamsaar textiles, R.C. Industry, Harihar Polyfibre, gives clear indications of planned industrial locations. Many industrial estates have come up in the town. The establishment of industrial estate in Harihar was taken up by the department of small scale industries of the Karnataka Government during the second five year plan. The department has spent about ₹8.7 lakhs with all
needed facilities. There are 36 sheds. All these sheds are occupied and most of them work as ancillary units for Mysore Kirloskar factory, indicating a case of 'agglomeration economy'. The location of industrial estates and labour colonies, just opposite the Mysore Kirloskar Ltd., and near to Harihar polyfibre strengthens this view.

Commercial Use

As noted above, the landuse pattern of Indian cities and towns is meant to serve various purposes. Out of the total developed area 32 hectares of land (6.26 percent) is used for commercial purpose. Harihar town is not a big commercial centre as compared to the Davangere unit. Most of the commercial transactions of Harihar unit are with Davangere. Harihar being a taluka head quarter is recently becoming an important commercial centre. Presently it serves the needs of surrounding villages.

Some portions of the commercial areas such as the fruit market, regulated area, Dalal market (commission agents) and Maruti street, are also used for residential and other purposes. But these are the only important commercial areas. The weekly market is held every Monday and about three thousand vendors come over here. They all sit along the important commercial streets like regulated market area, Maruti
road and Bazar road. This type of street selling has led to various problems as the vendors occupy about 2/3 of the width of roads. As a result of it, accidents use to take place. Along the main roads in the residential areas, front portions of the houses are used for commercial purpose. In addition to it, there are good number of shops scattered throughout the town to fulfill the needs of residential areas.

Public and Semipublic Use

The area devoted for this purpose is about 81 hectares or 15.82 percent of the developed area. There is more concentration of public and semipublic use in the centre of the town. As it is a taluka head quarter, considerable area is used for schools and government offices. High schools, colleges and government hospitals are located out of the core area of the town. Primary schools and K.G. schools are distributed throughout the town to facilitate the residential areas.

As Harihar is an industrial centre, some public parks have been developed in the town. To mention some of them, Mahatma Gandhi park, Nehru park, and a park in the industrial estates, are well planned with modern amenities (photo ).
3.5.0 Land Values

The two concepts that land is the complex of natural
opportunities offered to labour and capital and the common
notion of the meaning of land value is its monetary worth -
the value of land in the market place. In urban units, land
value is an important factor in respect of location and
situation. The land value varies according to the functional
zones of the city. Price of land may be high due to the
shortage of space within the limits of important localities.
Factors of 'market orientation' and 'physical scarcity' are
prominent in the case of urban area and make the characteristic
of urban land much vulnerable to various changes in economic
and social variables. This brings the importance of the 'space'
and 'site' so far as urban areas is concerned. In Davangere
and Harihar, there is no control on land prices and hence, it
is disproportionately high, compared to the cost of the
buildings. The cost of an average site for a private residence
may be equal to, or even more than the cost of the buildings.
This is more predominant in Davangere. Land value change with
a change in functions. Such features occurred in both units.
It is sometimes due to movement of industrial establishments.

* Based on Survey work.
As the functional zones influence the prices of land value, it is being considered under the following functional zones:

1. Commerce
2. Industrial
3. Residential
4. Public and Semipublic and others

Amongst these functions, the city's industry and commerce, together and its sizes and location are important considerations affecting the city's land values. The quality of the streets and accessibility to housing and to commerce are other factors which have a bearing on a city's land rent. The highest price is being charged and paid for commercial areas in the heart of the city. From the point of maximum value land values steadily and uniformly decrease outward in all directions from this point. But in some directions, the land values may be higher due to the importance of the functions such as industrial estates, etc. This changes the uniformity of land values. This is a truism in the Davangere unit, where the locations of industries have changed the shape and size of the city. In Davangere, Kaipete, Dalal market, which costs ₹12,000 to ₹15,000 per 100 Sq.Mts. Like wise, Harihar also having the highest price in the core but much lower than that of Davangere, as it is costs ₹8,000 to 10,000 / 100 Sq.Mts.
Fig: 9. LAND VALUES OF DAVANGERE

INDEX
FIG IN 000 Rs/100 sq mts

- 6 - 10
6 - 8 10 - 12
8 - 11 12 - 14
> 14

320 0 320 640 960 Mts.
The periphery area of Davangere costs Rs.4,000 / 100 Sq.Mts and the periphery area of Harihar costs Rs.15,00 to 2,000 / 100 Sq. Mts. Thus the contrast in the prices is greater at Davangere from the periphery of the fringe than that of Harihar.

Residential areas also cost more, especially along the main roads, where industries are located in the residential areas. These areas have been facilitated by sewage, water lines, and transport. Towards the interior from the main street, prices are less. As a result of increase of the accessibility to the main streets land prices go up, because the frontage area of each building is used for commercial purpose. Secondly, in some areas at Davangere and Harihar, land prices are lower due to the pollutant air from the small scale industries such as puwa mills, etc. Such areas are Azad colony and Brahmapuri, respectively. Along Davangere and Harihar road, the prices of vacant land between industries and residential areas, are higher than in the interior localities, because these areas have vast scope for future industrial and commercial developments. Along Poona-Bangalore road in the south east and north west, and Basapur road in the east, land fetches higher prices i.e. about Rs.8,000 / 100 Sq.Mts. in the Davangere unit.

The land values also changing according to the change in socio-economic conditions which is not stagnant but dynamic in character. From 1940 to 50 land prices were even below
Fig. 16 LAND VALUES OF HARIHAR

INDUSTRIAL PROPERTY

TUNGABHADRA

FIG. IN. 000 Rs/100 sq.mts

INDEX

> 10

6-8

2-6

< 2

6-8

4-6

24 6 24 48 72

Map
1/3 of the present prices. Hence the prices go up as the growth of various industries and the standard of living improves. Thus it highlights that the land values in the twin towns follows the growth of city accessibility and different premises. On the whole, land value is determined on the basis of the importance of localities. The villages had purely rural land scapes and an agricultural bias, but as years rolled by, people from the city started to settle in the neighbouring villages on permanent basis. As a result of it the values of land rose higher and higher for residential purpose. Presently the value per 100 Sq.Mts. ranges from ₹2,000 to 5,000 (Fig. 9 and 10). The researcher's experience shows that in the near future this price may rise up to an extent of ₹8,000 / 100 Sq.Mts. This is predominantly occurring in villages which are located along the high way between Davangere and Harihar. This is mainly due to the proposed industrial belts along the high way.

3.6.0 Villages Within the Study Region

With the growth of manufacturing industries, the villages in India have experienced changes of a far reaching nature. Physically, socially and economically, the villages within the study region have been changing rapidly from rural matrices to urban character. The reason for this rapid change
is that the middle and poor class workers prefer to stay in the neighbouring villages where living is cheap. As a result of it, the economy of villages within the study region has been changing due to the impact of occupational change from the primary to tertiary activities. To study the impact of the twin towns on the surrounding villages, some villages have been selected to measure the impact of Davangere and Harihar. Presently twelve villages have been selected out of the fifty-five villages, which are located in the area of dominance.

Presently the morphological development and increase of houses have been dealt. As a result of migration from the distant villages people started to settle at the surrounding villages on account of low standard of life. This has caused high demand for houses. To meet adequate housing facility local people started the construction of houses in the surrounding villages. This was mainly, initiated by the well-to-do families. The effect of this is seen in the increase of number of houses, morphological extension and increase in population.

The general impact is found in the construction of buildings, materials used, architecture and design and other amenities such as electrification, sanitation, water supply, medical services, educational facilities, transport, etc. Table - 5, reveals the growth of population, houses and area of
selected villages of the study region. The high rate of growth is identified during 1971-76. Both units influence on the morphology of villages. Nearby villages have higher rate of growth of population and houses than distant settlements, eg. Avargere, Dodbat, Shabanur, and Betur and near Davangere and Nalawagal, and Guttur near Harihar. The villages which are located at a distance from both the units have lesser impact than the above villages. The distant villages, namely Kurki, Bannikodu, Igoor, etc, have a lesser impact. In the above mentioned villages, more than fifty percent of houses have been provided with modern amenities.

The materials used for the construction of buildings between old and new can be marked distinctly. The new buildings have been constructed with tiles, cemented and R.C.C., whereas old houses were constructed by mud and black tiles. The physical expansion is also easily marked in these villages. Most of these settlements are spreading along the approach roads of the respective villages, which are connected to Davangere and Harihar. The vacant land in these villages is completely occupied by the new constructions with the above said characters. Every house has at least 3-5 rooms. In case of old constructions each house has only three rooms and a cattle shed is also a part of the house. This type of construction is not found in the newly constructed houses.

+ Based on survey work.
Table - 5

GROWTH OF POPULATION, HOUSES AND AREA IN THE SELECTED VILLAGES

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Averagere</td>
<td>1277</td>
<td>210</td>
<td>2780</td>
<td>556</td>
<td>3121</td>
<td>682</td>
</tr>
<tr>
<td>Bannikodu</td>
<td>1559</td>
<td>290</td>
<td>2361</td>
<td>334</td>
<td>1989</td>
<td>672</td>
</tr>
<tr>
<td>Betur</td>
<td>2682</td>
<td>312</td>
<td>4300</td>
<td>690</td>
<td>5112</td>
<td>886</td>
</tr>
<tr>
<td>Dodabati</td>
<td>1948</td>
<td>416</td>
<td>3042</td>
<td>519</td>
<td>3854</td>
<td>689</td>
</tr>
<tr>
<td>Guttur</td>
<td>1635</td>
<td>248</td>
<td>2402</td>
<td>372</td>
<td>1883</td>
<td>392</td>
</tr>
<tr>
<td>Halasabalu</td>
<td>522</td>
<td>210</td>
<td>998</td>
<td>358</td>
<td>2348</td>
<td>696</td>
</tr>
<tr>
<td>Igoor</td>
<td>1635</td>
<td>271</td>
<td>2040</td>
<td>348</td>
<td>2889</td>
<td>521</td>
</tr>
<tr>
<td>Kurki</td>
<td>2181</td>
<td>152</td>
<td>1234</td>
<td>234</td>
<td>2118</td>
<td>415</td>
</tr>
<tr>
<td>Konana Tambagi</td>
<td>795</td>
<td>221</td>
<td>812</td>
<td>319</td>
<td>2168</td>
<td>512</td>
</tr>
<tr>
<td>Nalwagal</td>
<td>495</td>
<td>196</td>
<td>748</td>
<td>318</td>
<td>1009</td>
<td>614</td>
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<tr>
<td>Sayagale</td>
<td>1850</td>
<td>353</td>
<td>2880</td>
<td>571</td>
<td>3568</td>
<td>779</td>
</tr>
<tr>
<td>Shabanur</td>
<td>2058</td>
<td>291</td>
<td>2954</td>
<td>454</td>
<td>3812</td>
<td>613</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18637</strong></td>
<td><strong>3170</strong></td>
<td><strong>26551</strong></td>
<td><strong>5073</strong></td>
<td><strong>33871</strong></td>
<td><strong>7471</strong></td>
</tr>
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</table>

Source: Chintradurga district Census Hand Book, 1971
* Estimated.
The factories are not able to provide quarter to the workers. Hence workers stay in the nearby villages. Shabnur, Avaragere, Dodabati, Guttur, Malwegal etc., are the best examples. Staying of well-to-do families made the villagers to construct the houses for rental purposes. The villagers within a radius of 10-15 kms., have sought the help of engineers, architects, and planners for construction of houses and industries. Newly built houses have been provided with a dining hall, a guest room, 1-3 bed rooms, etc. These were not seen before the establishment of industries i.e. in 1951.

Accordingly the number of houses have increased to a considerable extent (table - 5) in the suburban villages. The same impact on morphology and housing is seen in the remaining villages of the study region.
REFERENCES


10. Ibid, p.258.


ADDITIONAL REFERENCES


