CHAPTER - 3
LAND USE ANALYSIS

3.1. INTRODUCTION

Land use analysis, undoubtedly, is one of the important aspects of applied geography. Land use patterns of a region is an outcome of both natural and socio-economic factors and their utilisation by man in time and space. Without land use analysis it is not at all possible to reveal the impact of environmental problems on land use and to suggest the potential land use pattern - these two being the most important parts of this thesis. Besides, land use maps help to direct the expansion of intensive land utilisation into potential areas, and to check undesirable trends of the irrational use of land.

The term ‘land use’ in the present study implies various activities carried out on land like agriculture, mining etc and land cover like forestry including social forestry. Vinc (1975) explained land use as “any kind of permanent or cyclic intervention to satisfy human needs from the complex of natural or artificial resources which together is called land”. “Land use, therefore, is the application of human controls in a relatively systematic manner in order to derive benefits from it (Vink, 1975).

The present day land use of the present study area is the product of past legacy accompanied by relationship between physical and cultural environments. As we know, the choice of land use in a given location is based largely on the extent to which soil characteristics match land use requirements. Other important physical controls include climate and relief while important human controls include socio-economic status of the land user, the nature of land tenure and the political and infrastructural characteristics of the region concerned. Above all the scope for making profit by the producer through the sale of excess produce is the chief impetus in intensifying the production in any area.

3.2 CHARACTERISTICS OF LAND USE

The main characteristics of land use pattern in Ajay damodar Interfluve, Asansol Subdivision are as follows:

1. The land use pattern in Ajay Damodar Interfluve, Asansol Subdivision, is widely varied. Almost all kinds of land use like agriculture, industry, mining, grazing, settlement and transport and communication are found within an area of 838.5 sq. km. (Fig. 3.1)

2. Dynamicity is another unique feature of the land use pattern of this region. The land which is now under agriculture may go under opencast or underground mining operation. When the mining operation would be over the same land may come under reclamation operation and forestry, to be precise social forestry and grassland would be created on the same land after being reclaimed. Actually the existence of underground high grade coal is responsible for such dynamic land use.

3. Agriculture stands at the top of the land use so far the spatial coverage is concerned (Fig 3.2). Paucity of irrigation, existence of infertile soil and thin soil cover in some places, lack of adequate rainfall etc. are responsible for very poor agricultural yield. However, in eastern part of the region better quality and quantity of crops are grown than in the western counterpart. In most of the places, except the lands adjacent to riverbanks and where farmers are able to arrange shallow pumps, mostly monoculture is practised.
Fig. 3.1
### Table 3.1: Different land use classes of Ajay Damodar Interfluve, Asansol Subdivision.

<table>
<thead>
<tr>
<th>Broad land use classes</th>
<th>Total area (sq. km.)</th>
<th>Area (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area under cultivation</td>
<td>415.35</td>
<td>38.38</td>
</tr>
<tr>
<td>Area under mining</td>
<td>83.25</td>
<td>7.35</td>
</tr>
<tr>
<td>Area under forest including social forestry</td>
<td>56.55</td>
<td>5.09</td>
</tr>
<tr>
<td>Area under other uses</td>
<td>548.50</td>
<td>19.18</td>
</tr>
<tr>
<td>Total</td>
<td>1103.65</td>
<td>100%</td>
</tr>
</tbody>
</table>

N.B.: The total area of the present study area mentioned in table 3.1 differs from the area mentioned elsewhere because it has considered the entire area of the grids, part of which falls out of the study area.

![Land use classes of Ajay Damodar Interfluve, Asansol Subdivision](image)

Fig. 3.2

4. Rearrangement of existing land use is another important characteristic of land use pattern in the present study area. The areas under mining and settlement are expanding sporadically. The underground geology of this region corresponds to the Gondwana formation which has vast reserves of good quality coal. Invention of new coal reserves lead to the opening of new coal mines for exploitation of coal. On the other hand natural growth of population as well as amount of emigration in this region in search of jobs make it one of the most densely populated regions of India. Mining operation, open cast mining in particular, drastically change the land use which was prior to the beginning of mining operation. Settlement, usually, expands over agricultural lands squeezing the amount of land under agriculture (Table 3.2).
Table 3.2: Shift of land from agricultural to non agricultural Use in Ajay Damodar Interfluve, Asansol Subdivision.

<table>
<thead>
<tr>
<th>Name of village</th>
<th>J.L.No.</th>
<th>Total area (Sq.km.)</th>
<th>Year</th>
<th>Agricultural Land (Sq.km.)</th>
<th>Non-agricultural Land (Sq.km.)</th>
<th>Decrease in Agricultural Land(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keshabganj</td>
<td>33</td>
<td>0.60</td>
<td>1992-93</td>
<td>0.46</td>
<td>0.14</td>
<td>10.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1995-96</td>
<td>0.41</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Gopalpur</td>
<td>10</td>
<td>1.52</td>
<td>1992-93</td>
<td>0.71</td>
<td>0.81</td>
<td>2.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1995-96</td>
<td>0.69</td>
<td>0.83</td>
<td></td>
</tr>
<tr>
<td>Raghunathbati</td>
<td>3</td>
<td>0.85</td>
<td>1992-93</td>
<td>0.59</td>
<td>0.26</td>
<td>18.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1995-96</td>
<td>0.49</td>
<td>0.36</td>
<td></td>
</tr>
</tbody>
</table>

Source: Block Land and Land Reforms Office, Asansol, 1996.

3.3 TYPES OF LAND USE

As mentioned earlier almost all kinds of land use with agriculture at the top are found in this region (Plate 3.1C). Mining is another important land use in this region (Plate 3.1D). Here the present study will be concentrated on opencast mining since only surface land use will be concerned, although the adverse effects of underground mining like subsidence, underground fire which impart their impact on surface will be discussed and included in the category of waste land. Mining sites produce dilapidated and despoliated structure interspersed by voids and waste dumps which are not capable of supporting any further land-based activities like agriculture or forestry or grazing unless some reclamation measures would be taken into consideration. The region also has a large number of small, medium and large scale industries (Plate 3.1E).

Ajay Damodar Interfluve, Asansol Subdivision does not possess separate grazing field as such. It damages agriculture field because soil lumps are broken by animal hooves. This cries out for separate grazing field in particular.

Transport and communication is also an important land use. This, in particular, occupies larger extent of land in urban areas than in rural part of the present study area. Specially, the big towns, like Kulti, Asansol, Barakar, Chittaranjan involve a large amount of land under transport and communication (Plate 3.1F).

Settlement, whether rural or urban, covers a large part of land in Ajay Damodar Interfluve, Asansol Subdivision (Plate 3.2A & B). Rural settlements, in general, except few big villages are smaller in spatial extent than urban settlements. Urban settlements, with their sprawling growth are grasping more and more land under this particular land use of settlement.

Ajay Damodar Interfluve, Asansol Subdivision is economically, no doubt, a prosperous region. Human activities, however, have created some undesirable effects on land creating lands unsuitable for desirable utilization. They are termed as waste lands. It is really difficult, although not impossible,
to bring back these waste lands to some economically viable land use. Such waste lands are more common in and around the coalmines - both active and exhausted, industrial and urban areas. So the amount of waste land is not negligible in this region. The present researcher considers those lands as waste lands which are unsuitable for any kind of use whatever the cause may be. Thus wastelands include the following kinds of lands:

   a) Natural wastelands with rock exposures rocky knobs etc. (Plate 3.2C).
   b) Post-mining lands dotted with depressions and small pockets of derelict lands.

Some of these lands are natural in origin, while some others are mainly secondary in origin and are created by faulty human activities.

Unfortunately the existing land use pattern, is not at all, at its highest potential, rather the lands are underused or wrongly used. Wet cultivation in a drought-prone area exemplifies this wrong way of land utilization very nicely. Paucity of water due to lack of rain, lack of irrigation, fluctuating underground water level, uncertain monsoon reign is the main problem in the present study area. Only dry farming can be able to acclimatize with the existing dry climate. Paddy, which is a water consuming crop often dries up in the field. Frequent crop failure is a very common phenomenon. Such faulty land use pattern should be rearranged and replaced by some other suitable land use which can fit in the existing physical and economic environment of the region.

Another example of faulty land use in the present study area is grazing on agricultural land (Plate 3.2D & E). Grazing, as mentioned earlier, damages soil structure on agricultural field severely about which the farmers are totally ignorant. This is revealed by the present researcher during her field survey. Grazing fields should always be kept separate from agricultural fields. If the farmers want to add animal excreta, they can bring it from other places but should not do so by leaving the cattle freely on agricultural lands. The grasslands created during reclamation work can best be utilised as grazing field. Such reclaimed lands gradually become suited for fodder cultivation and dairy farming.

During field survey, it was revealed to the present researcher that some of the agricultural lands, which are not suitable for cultivation are still cultivated with hard labour. This results in wastage of land, labour and seed and produces very poor yield or crop failure.

Land is a very important natural resource and it needs proper utilization for the all out development of the region associated. This is also true for the present study area. Due to the locational importance the value of land is escalating steadily. There are some climatic, edaphic, physiographic and socio-economic hinderances on the way of proper land use pattern. Lack of proper knowledge regarding scientific land use and lack of Government initiatives have left the region in its original state where under use of land is prevalent. The existing land use pattern in most of the cases are unscientific and faulty.

A.D.D.A., CMPDIL etc. are the institutions which are trying to chalk out realistic and fruitful plans for the betterment of existing land use conditions. An extensive part of the region is under the category of wastelands. Very few of these lands have been reclaimed except for creating grasslands and forests over them.
Plate 3.2: Land use / land cover.  Clockwise from top left.  A: Rural settlement.  B: Urban settlement at Kanyapur.  C: Natural wasteland with very thin soil cover and exposed rock.  D & E: Cattle are grazing on the land used for agriculture and afforestation.