16

AGRICULTURAL USE OF TERRAINS

• LAND TENURE

• CASTE SYSTEM

• SOWN AREA OF TERRAINS

• FIELD PATTERN

• CROPPING PATTERN

• BLOCK WISE TERRAIN USE
The identification of different capability classes of terrains in terms of agriculture has been made in Chapter 13 and the acreage under cultivated terrains in various blocks of the Chhatrapur Subdivision has also been mentioned in Chapter 14. The account of irrigation which is an aid to agriculture reveals that its resource is not adequate even for existing agricultural practices in the study area (Ch.15). The discussion in this chapter aims at describing and analysing the aspects of agricultural use of terrains which will lead us to conclude whether the use is proper and optimum or whether the study area needs extension of agricultural land to cultivable terrains, necessitates efforts to take more returns by improvement in practices and inputs or it
needs behavioural changes in socio-economic structure. Before we go into such details of planning and suggestions in the forthcoming chapter, let us discuss here existing agriculture use and its related phenomena.

16.1. LAND TENURE AND TENANCY

Tenancy implies a divorce between agricultural land ownership and cultivation and is primarily the result of the inability or the unwillingness of the owner to undertake personal cultivation. The inability may arise on account of the owner being a woman, a minor or a person suffering from physical or mental disability, caste restrictions, or on account of the owner residing in too distant a place to make personal cultivation possible or on account of his having an alternative living, more profitable than agricultural occupation, which he cannot forego. Unwillingness may also be due to the land-holding which is too small and fragmented. The possibility of getting high rent is also a circumstance which encourages tenancy. In this manner, the land owners in different parts of the Chhatrapur Subdivision have been observed to be the privileged few whose 'gradual usurpation of the common pasture and village wastes and whose absenteeism led to a deterioration of the village collectivism and economic welfare' (Ahmad, 1976, p.203). As a result of which the proportion of agricultural labourers increased in most parts of the
Subdivision inspite of land legislations to that effect. The fragmentation of holdings in accordance with the law of inheritance and the growth of population have reduced petty tenants even to the status of landless labourers. Under the present system of tenancy in the Chhatrapur Subdivision the land-owners are least keen about any agricultural progress of the area but are rent receivers merely.

The movement of land reform, however, received considerable impetus in the Chhatrapur Subdivision since the abolition of Madras Estate Act, 1952 (Ch.14) keeping in view the aspect of agricultural production and bring about suitable changes in the structure of agriculture with a view to extend maximum advantage to the small farmers. Such land reforms include the abolition of intermediaries, tenancy reforms, consolidation of land holding, imposition of land ceilings, etc., which are partly adopted in many parts of the Chhatrapur Subdivision. Steps are also taken to maintain land records and to provide adequate revenue administration which also stressed the need to regularise the relationship between the land-owners and tenants or the Bhagchasis (share-croppers).

The Orissa Tenants Protection Act (Act.3 of 1948) and the Orissa Tenants Relief Act (Act 5 of 1955) were passed in 1949 and 1954 respectively with a view to giving temporary
relief to the Bhagchasis or share-croppers. These acts had absolutely no effect on the record-of-rights. This serious lacuna in the law continued even after repeal of the Madras Estate Land Act by the Orissa Estate Abolition Act (Act I of 1952). This has since been removed by the passing of the Orissa Survey and Settlement Act, 1958, under which the rights of all classes of tenants can be recorded. In March 1954 the abolition of landlordism had been fully implemented and a new tenancy system has been introduced by which cultivators have become owners of land to which they have been paid compensation for their land. The new tenancy system provides two classes of tenants, namely (a) tenure-holders, and (b) ryots. There are three classes of ryots: namely, occupancy ryots, non-occupancy ryots, and ryots holding fixed rates, and the incidence of right of each class or ryots.

All the tenants who previously held land from the landlords became ryots. A tenure holder has a permanent heritable and transferable right in his holding and also the right to use his land for any purpose for whatsoever. The interests of a ryot and other two categories are non-transferable on account of lease limitations.

With the several enactments of tenancy protection acts the problem of tenancy continues to operate in the study area. The absolutism of landlords came to an end while an observable usurpation of the common interest through the
dominance of castes appear to be more or less synonymous with the erstwhile zamindary tenance system. The evils of casteism in the Chhatrapur Subdivision seem to stand against tenancy protection and tell upon the growth and intensity of agricultural land utilisation in the study area. The very structure of a village in the Subdivision at present has been observed by the author as determined by the segregative aspect of the caste system especially the predominance of the dominant caste expressing its spatial and socio-economic dominance.

16.2. ASPECTS OF CASTE SYSTEM

In the Subdivision of Chhatrapur, a particular caste or jati (such as, Brahmin, Karan, Kumuti, Chasa, Teli, Tanti, and etc.) is considered dominant in an area when it owns a major portion of the agricultural land which is the principal means of production. In the Subdivision the dominant castes like the Brahmins and Kumuties (a business and/or money-lending class) are traditionally forebidden to plough the land. Thus, they employ quite a large number of agricultural labourers. There are also numerous examples of villages in the Subdivision where fairly large proportions of productive agricultural land belong to traditional farmers' castes such as Chasas, Karans, Telies and Tanties. The farmers of these castes cultivate their land themselves, engage few agricultural
labourers and, therefore, their control and influence on the landless labour class can be considered as less important than those of the exploiting Brahmin or Kumuti landlords. In precise it may be noted that the degree of dominance of a particular caste or jati in the Subdivision is determined by its economic status and not necessarily always by the Hindu social structure comprising a functioning system (Bichsel, 1989, p.34). Because even our Brahmins have been observed as subservient to the economically leading lower castes comprising Karans, Tellies and Kumuties, etc., in some parts of Hinjili, Purusottampur, Chatrapur and Ganjam blocks.

Today the Kumuties, Brahmins and Karans of the Chhatrapur Subdivision are mostly the owners of large plots which are in a process of conditional transfer of theoretical ownership of land to the tenants who have been cultivating their lands since a long period. Therefore, these Brahmins, Karans and Kumuties of the Subdivision are merely the owners of land but not farmers, and who presently live far away from their land and cannot completely supervise the farming on it. Therefore, it is a fact and may be noted that the structure of the agricultural land utilisation over most of the Subdivision is characterised by few land owners and a large number of landless and economically backward tenants. These aspects of caste superiority in terms of
economic status drastically and adversely affect the effectiveness of several agricultural and community development programmes implemented from time to time. Therefore, the overall intensity and extension of agricultural landuse are severely affected by the economic superiority of a few land owners irrespective of their castes. This aspect of caste system is well manifested in the high frequency of occurrence of large field units of cultivable fallow lands over most of the Chhatrapur Subdivision.

Considering even this aspect of caste system, one should not forget that the open-mindedness of the traditional elite is very important keeping in view the predominance of agriculture in the economy of the Chhatrapur Subdivision. The dominant caste whose-so-ever it may be is significant as the medium of diffusion of new strategic agricultural planning ideas in the ultimate socio-economic development of the agriculturally dominated Chhatrapur Subdivision. If the traditional castes of dominance offer no response, as observed in the study area at present, to generate this lengthy process, the socio-economic situation in the Subdivision and especially of the agricultural workers does suffer. Because it has been observed by the author during his field investigation in parts of Kodola, Polosara and Khalikote blocks that it is justly impossible for the economically backward Dandasi, Saura, Kondh and other Harijan castes
to participate in this long process of socio-economic inno-
vation, and to adopt new ideas without any substantial assis-
tance so far as their total involvement in the agricultural
land utilisation operation, intensity, expansion and develop-
ment to the optimum limit in the Chhatrapur Subdivision is
concerned.

16.3. TERRAIN TYPES AND SOWN AREA

The sown area is distributed over most of the terrains
in the Chhatrapur Subdivision (Fig.16.1). The hilly terrain
presents a marked exception in this regard. The only northern
hilly panchayats of Pandiripada and Gochhabadi in Polosara
block account for 81.84% and 78.68% of their total area
under crops respectively. The landuse in these panchayats
may partly be attributed to some kind of subsistence farming.
The low gradient rugged and moderately sloping upland terrain
units impart significant parts of their terrain area for
agricultural use. The most significant cultivated terrain
units of the Chhatrapur Subdivision virtually coincide with
the nearly level and level land units barring exceptions
like littoral and lacustrine lands.

With the two major cropping seasons, kharif and rabi,
in a year, with varied soils, different meteorological
conditions and large area under cultivation the terrain
of the Chhatrapur Subdivision presents a unique position in the Ganjam District and adopts every possible pattern of cropping, field pattern and so on as any other Subdivision of the District. The Subdivision produces a variety of paddy, cereals, pulses, oil-seeds, vegetables, commercial plants including extensive betel leaves, and seasonal fruits. More than 70 per cent of its population is rural and agriculture is the main occupation.

In 1971 (Table 14.8) out of the total geographical area (214200.00 hectares) the Subdivision of Chhatrapur accounted for 66.53% as cultivated terrain (irrigated area, unirrigated area and cultivable wastes). This figure had gone down to 63.65% during 1981 (Table 14.8). There was, however, a marginal rise in the proportion of cultivated terrain to the tune of 64.47% of the total geographical area during 1991.

A look at the agricultural crop-use maps (Figs. 16.1 to 16.3) dividing the Chhatrapur Subdivision into several agricultural crop-use zones (1990-91) suggests that the variety in the panchayatwise distribution (Appendix III) is almost according to a corresponding regional variation in the existing terrain conditions besides other conditions relating to the socio-cultural and economic agricultural practices. This variation is also due to technology transfer and scientific farm methods basing upon proper combinations of seed (Indian Seeds Act, 1966, p.27), fertilizer and pesticides in a
(Agricultural Research Report, 1986, pp.1-119) well-concerted manner although on a very limited scale. The state government of Orissa have been carrying on land reforms with the ultimate aim of making the tenants see more through land ownership laws (Orissa Gazette, 1963, pp.20-28). Steps in checking fragmentation of agricultural land in view of consolidation of land holding have also been taken. Therefore, the structure of agricultural land utilisation in the study region needs an analytical treatment in the regional geographical, socio-cultural and agro-economic landuse perspective with emphasis and reference, however, to the regional terrain characteristics of a reporting area in the Chhatrapur Subdivision.

16.4. FIELD PATTERN OF CULTIVATED TERRAIN

A study of field pattern of the agricultural plots of the cultivated terrain in the Chhatrapur Subdivision is essential with a view to establish the degree of natural and potential relationship between the agricultural activities and the field units. In this context, the size and shape of the fields determine the suitability and extent of cropping, magnitude of use of scientific equipments and implementation of development programmes. The Chhatrapur Subdivision has at present a variety of plots of varying shapes and sizes. A many of these plots are also of undefinable shapes. The common plot patterns are, however, either
rectangular or square or oblong irrespective of the size specifications. The unusual field pattern over most of the Chhatrapur Subdivision consists of shapes as 'arcuate', 'semicircular', etc. These are partly due to extensive land fragmentation or geographical specification accorded by the terrain itself.

The shape and size of the agricultural plots have been patterned according to the underlying terrain conditions of slope in almost all surface elevation zones of the study area. The factors, slope and water requirements of different crops, appear to have influenced the shape and size of plot. On lesser slopes wider areas are to be had for easy levelling and terracing (Prasad, 1973, p.60). The land which is uncul­tivated cultivable may have bigger plots at higher gradient. The phenomenon was observed by the author in the high gradi­ent slope zones of the Khallikote and Polosara blocks of the Chhatrapur Subdivision. This slope factor is more or less passive where there is fragmentation of land holdings under social circumstances.

The bearing of terrace can be easily visualized on the Eastern Ghat highlands, upland moderately sloping and mod­erate gradient rugged lands of the Chhatrapur Subdivision. On upland situations the plots are rectangular and are mostly of large sizes. The bigger size of holdings in
parts of Kodola, Khallikote, Polosara and Ganjam uplands are more or less due to no litigation relating to land subdivision. The shapes of these big plots in parts of Kodola, Polosara, Purusottampur, Khallikote and Kavisuryanagar uplands follow a pattern according to the curvature of Meandering of Jagati, Bhaguva, Dhanei and Kharkhari rivers of the northern Rushikulya system (Fig.5.1). The smaller width of the plots in the upland areas of the Chhatrapur Subdivision are due to comparatively greater gradient of slope, therefore, some plots are only 6 to 7 metres wide and around 540 metres in length or more.

The plots are usually oblong in the lowlands in the south and along the Rushikulya river where they run almost parallel to the contour. Nearer the river beds on either side of Rushikulya in Hinjili, Kavisuryanagar, Purusottampur, Chatrapur and Ganjam blocks the regional slope becomes gradually gentler and the fields become smaller particularly in their lengths. In other words, where-ever there are flat and gentle parts in the river valleys, the agricultural fields are more open and comparatively wide and large in size.

The rectangularity or any irregular shape of a plot in parts of Hinjili, Purusottampur, Chatrapur and Ganjam blocks is also found to be influenced by the annual floods. The
land owners of the plots that are adjacent to the Rushikulya bed, extend their legal ploughing rights over the new lands emerging after the recession of flood water. This aspect has also contributed to the development of 'rectangular' patterns besides 'parallelogram' or 'ribbon' or other field patterns.

The conspicuously smaller size of the land-holding in the south of Rushikulya especially in Hinjili and Purusottampur plains (Ch.10) is not always due to the specifications set by the terrain conditions. It is generally accepted in these parts that poorer the land potential larger the holding and better the land potential or closer to settlement, smaller the holdings.

The average size of agricultural holding in different parts of the Chhatrapur Subdivision varies from less than 1.62 hectares to more than 3.5 hectares. The size of holding decreases from north to south, from rural area to rur-urban fringe area and sparsely peopled area to densely peopled area. Likewise, per capita agricultural holding in the Subdivision is also much less than 0.15 hectares in comparison to the Ganjam District's average of 0.16 hectares and Orissa state average of 0.20 hectares (1990-1991).
16.5. CROPPING PATTERN

The general distribution of crops in the Subdivision of Chhatrapur displays a great deal of diversity which is largely related to the varying combination of relief, rainfall and soil conditions. More so, the cropping pattern of the study area, which is more or less uniform, has adjusted itself to the irrigation facilities and the traditional social conditions over and above its basic natural components of the agricultural land utilisation.

As we know that agriculture is the main occupation of the people in the study area, both cereal and cash cropping is carried mainly by manual labour. The Subdivision of Chhatrapur presents a more or less homogeneous cropping pattern with paddy occupying the bulk of its cultivated terrain. The conspicuous regional variation in the cropping pattern, however, is related to a greater extent to the contrasting surface forms while the social factors remain more or less constant. It is this variation in the cultivation of secondary crops that the cropping pattern of the Chhatrapur Subdivision may be broadly divided into the upland and lowland patterns. It results in three systems of cropping:

1) **Dry system** on the hilly and high gradient rugged terrain units;
2) **Partially wet system** on the high and medium paddy lands of the moderate gradient rugged and moderately sloping upland terrain units; and

3) **Wet system** on the high, medium and low-land paddy areas of the nearly level and level terrain units and the low-land paddy regions of upland and rugged terrain units.

Similarly the farming methods in different surface elevation zones of the Chhatrapur Subdivision range from crude to unscientific and primitive to modern and scientific. The later is limited to the non-hilly and less rugged uplands and level lands of the Subdivision.

In **kharif** season more than 80 per cent of the area is under paddy and rest under pulses and other cereals. In **rabi** season pulses cover more than 80% and oil-seeds and vegetables account for the rest. The **kharif** crops virtually predominate the crop-sequence of the cultivated terrain of the Chhatrapur Subdivision whereas the **rabi** crops are grown only in areas where the availability of water is assured.

In the northern half of the Chhatrapur Subdivision, the upland and rugged terrain units constituting parts of Kavisuryanagar, Kodola, Khallikote and parts of northern Purusottampur block grow paddy or ragi on the same land year after year. A major part of the Chatrapur uplands and
 plains of Chatrapur and Ganjam blocks also adopt some kind of monoculture owing to the terrain constraints of slow as well as superficial permeability, extensive littoral and other salinity conditions of the soil surfaces. In these saline tracts of Ganjam and Chatrapur blocks the conspicuous awareness of the commercial plantation of cashew, however, came up late. Being a robust tree, it is capable of withstanding long spells of dry climate and grows well even on degraded lands unsuitable for other crops.

The low undulating nearly level lands comprising the southwestern Kavisuryanagar, west-central Polosara block, southern Kodola, southwestern Khallikote, northeastern Purusottampur and southwestern Hinjili blocks grow crops of short duration in their fields.

Taking of more than one crop on the same land in the same year or season has been taken note of by the author over the vast fertile level lands of Hinjili and Purusottampur plains, parts of Kavisuryanagar lowlands and the riverine Ganjam and Chatrapur plains. The plain lands of Hinjili and Purusottampur blocks are in fact the rice granaries of the Chhatrapur Subdivision.

Among the crops, as already mentioned, paddy is the most staple cereal and is also raised as cash crop in all blocks of the Chhatrapur Subdivision. The existing pattern
of cropping in all blocks of the Chhatrapur Subdivision has been observed as set according to the capacity of a particular means of irrigation and availability of water through other natural sources more or less in the line of the following exemplary sequence at the panchayat levels in all blocks of the study area:

<table>
<thead>
<tr>
<th>Name of the Panchayat</th>
<th>Name of the irrigation point</th>
<th>Adjacent area (hec.)</th>
<th>Cropping pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sikiri (Hinjili block)</td>
<td>Lift irrigation point I</td>
<td>11.19</td>
<td>Betel leaf, Mung.</td>
</tr>
<tr>
<td></td>
<td>Lift irrigation point II</td>
<td>12.94</td>
<td>Betel leaf, Mung, dry paddy, ragi, chilli.</td>
</tr>
</tbody>
</table>

Source - A.E.O. Hinjili block (Agricultural Extension Officer).

The cropping pattern of an exclusively rainfed farming of the Chhatrapur Subdivision has been taken note of as an example as adopted at both panchayat and block levels as follows:

<table>
<thead>
<tr>
<th>Land situation</th>
<th>Type of cropping</th>
<th>Cropping pattern</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upland</td>
<td>Sole/Single Cropping</td>
<td>Groundnut/Arhar,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ragi/Maize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sequence Cropping</td>
<td>Ragi</td>
<td>Green-gram</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black-gram</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Horse-gram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rice</td>
<td>Horse-gram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groundnut</td>
<td>Horse-gram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rice</td>
<td>Arhar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rice</td>
<td>Groundnut</td>
</tr>
</tbody>
</table>
CROPPING PATTERN

<table>
<thead>
<tr>
<th>Land situation</th>
<th>Type of cropping</th>
<th>Cropping pattern</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inter Cropping</td>
<td>Arhar +</td>
<td>Rice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arhar +</td>
<td>Groundnut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arhar +</td>
<td>Ragi</td>
</tr>
<tr>
<td>2</td>
<td>Sequence Cropping</td>
<td>Rice/Mung/Black-gram</td>
<td>Horse-gram</td>
</tr>
<tr>
<td>3</td>
<td>Sequence Cropping</td>
<td>Rice/Black-gram</td>
<td>Mustard</td>
</tr>
<tr>
<td>4</td>
<td>Sequence Cropping</td>
<td>Rice/Black-gram</td>
<td>Arhar</td>
</tr>
<tr>
<td></td>
<td>Relay Cropping</td>
<td>Rice/Black-gram</td>
<td>Groundnut</td>
</tr>
</tbody>
</table>
| Source:  Directorate of Agriculture & Food Production, Orissa, Bhubaneswar.

As the informations with regard to the above cropping pattern are not available for all panchayats, the author presents the available block-wise informations of the cropping pattern in the Chhatrapur Subdivision in his concluding lines as follows:

<table>
<thead>
<tr>
<th>Name of block</th>
<th>Cropping pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chatrapur</td>
<td>Paddy/Groundnut/Ragi/Mung/Biri/Arhar</td>
</tr>
<tr>
<td>2. Ganjam</td>
<td>Paddy/Ragi/Groundnut/Mung</td>
</tr>
<tr>
<td>3. Khallikote</td>
<td>Paddy/Ragi/Groundnut/Biri</td>
</tr>
<tr>
<td>4. Purusottampur</td>
<td>Paddy/Groundnut/Arhar/Mung/Biri</td>
</tr>
<tr>
<td>5. Kodola</td>
<td>Paddy/Groundnut/Pulses</td>
</tr>
<tr>
<td>6. Hinjili</td>
<td>Paddy/Ragi/Biri/Groundnut/Mung</td>
</tr>
</tbody>
</table>
Name of block | Cropping pattern
--- | ---
7. Polosara | Paddy/Groundnut/Ragi/Mung/Biri/Vegetables/Sugarcane

The actual cropping system, especially the secondary cropping in each block has been observed to be deviating to some extent from the pattern mentioned above. The secondary cropping in all blocks of the Chhatrapur Subdivision, apart from the local exceptions at panchayat levels, includes a variety of crops in addition to paddy such as kharif Ragi, Maize (local), Maize (HYV), Biri, Mung, Arhar, Cowpea, Groundnut (local), Groundnut (improved variety), castor, _til_, vegetables, sweet potatoes, chilli, Mesta, Sunhemp and Dhanicha. Similarly the _rabi_ secondary cropping pattern in irrigated tracts includes HY. paddy, Wheat, Ragi, Maize, Potato, vegetable, Onion, Garlic, Chilli, Betel leaves, Groundnut and Mustard. The _rabi_ unirrigated cropping pattern consists of vegetables, Sweet potatoes, Mustard, _Til_, Groundnut, Mung, _Biri_, other pulses, Black-gram, _Kulthi_, Arhar and Coriander, _etc._

16.6. **BLOCK-WISE UTILIZATION PATTERN OF CULTIVATED TERRAIN**

The proportion of arable land and its distribution in different blocks is more or less uniform excepting in Chatrapur
and Ganjam blocks. These two blocks register a recorded low of 47.94% and 57.54% (Table 16.1) with regard to the cultivated area in per cent to the panchayat area owing to a set of their environmental constraints.

The general declining trend in the *rabi* agricultural landuse statistics (Table 16.1) is, however, fitting well with the terrain problems of the Chhatrapur Subdivision. The general decline of land under plough during the *rabi* season is attributed to the presence of hills, hillocks, gullied tracts, hard rock basement and above all, waterlessness. Except Purusottampur and Hinjili blocks, no other block of the Chhatrapur Subdivision shows a potentially increasing trend in respect of the *rabi* agricultural land utilisation.

The conspicuous regional variation with regard to both the *kharif* and *rabi* agricultural land utilisation at the panchayat levels (Appendix III) in all eight blocks of the Chhatrapur Subdivision is still more thought-provoking. The overall picture in this regard is considerably influenced by a complex combination of relief, slope, soil, surface and underground drainage conditions including land degradation. The role of socio-cultural and traditional economic functioning systems in influencing the pattern of distribution and extent of agricultural landuse are equally significant.
### TABLE 16.1 - BLOCK-WISE SEASONAL CROPLAND UTILISATION IN THE CHHATRAPUR SUBDIVISION (Figures in Hectares)

<table>
<thead>
<tr>
<th>Name of blocks</th>
<th>Panchayat area</th>
<th>Cultivated area</th>
<th>% of 2 to 1</th>
<th>% of 2 under paddy</th>
<th>% of 4</th>
<th>% of 6</th>
<th>% of 8</th>
<th>% of 10</th>
<th>Total area under rabi</th>
<th>% of 12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
| Hinjili        | 15587.45       | 12382.76        | 79.44       | 10868.94          | 87.78  | 1430.21| 13.16  | 1560.78| 29.08               | 6277.95| 57.76
| Khallikote     | 28127.13       | 19992.34        | 71.08       | 13431.27          | 67.18  | 2058.24| 15.33  | 5412.98| 40.30               | 5960.05| 44.37
| Kodola         | 22055.06       | 17170.96        | 77.86       | 11999.07          | 69.88  | 532.00 | 4.43   | 5333.62| 44.45               | 6133.45| 51.12
| Polosara       | 19883.81       | 14891.15        | 74.89       | 10294.11          | 69.13  | 2643.73| 25.68  | 3443.94| 33.46               | 4206.44| 40.86
| Purusottampur  | 24696.76       | 19394.13        | 78.53       | 15520.08          | 80.08  | 3232.02| 21.40  | 6096.64| 39.25               | 6111.02| 39.35
| Ganjam         | 21853.04       | 12573.52        | 57.54       | 6673.08           | 53.07  | 711.75 | 10.67  | 2645.32| 39.64               | 3316.01| 41.69
| Kavisuryanagar | 16704.05       | 14467.70        | 86.61       | 9880.00           | 68.29  | 2809.78| 28.44  | 4107.29| 41.57               | 2962.93| 29.99
| Chatrapur      | 24052.23       | 11531.00        | 47.94       | 6982.87           | 60.56  | 2234.50| 32.00  | 2760.46| 39.53               | 1987.91| 28.47
| **TOTAL**      | **172959.53**  | **122403.56**   | **70.77**   | **85783.01**      | **70.08**| **15743.23**| **18.35**| **33084.02**| **3857**| **36955.76**| **43.08**| **34603.61**| **20.01** |
From the cultivated terrain utilisation point of view, the agricultural landscape of the Chhatrapur Subdivision may be divided into the following agricultural landuse zones (Figs. 16.1 to 16.3) in accordance with the frequency of occurrence of the available agricultural landuse informations:

**Kharif**
(Figures in percentage)

1. **Cultivated area in percent to panchayat area**

<table>
<thead>
<tr>
<th>Percent class</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 80</td>
<td>High (rich)</td>
</tr>
<tr>
<td>71 - 80</td>
<td>Moderately high (rich)</td>
</tr>
<tr>
<td>61 - 70</td>
<td>Moderate</td>
</tr>
<tr>
<td>51 - 60</td>
<td>Moderately low (poor)</td>
</tr>
<tr>
<td>50 and below</td>
<td>Low (poor)</td>
</tr>
</tbody>
</table>

2. **Paddy land in percent to the cultivated area**

<table>
<thead>
<tr>
<th>Percent class</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 80</td>
<td>High (rich)</td>
</tr>
<tr>
<td>71 - 80</td>
<td>Moderately high (rich)</td>
</tr>
<tr>
<td>61 - 70</td>
<td>Moderate</td>
</tr>
<tr>
<td>51 - 60</td>
<td>Moderately low (poor)</td>
</tr>
<tr>
<td>50 and below</td>
<td>Low (poor)</td>
</tr>
</tbody>
</table>

**Rabi**
(In percent to panchayat area)

<table>
<thead>
<tr>
<th>Percent class</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 30</td>
<td>Moderate</td>
</tr>
<tr>
<td>26 - 30</td>
<td>Moderately low (poor)</td>
</tr>
<tr>
<td>&lt; 25 and below</td>
<td>Low (poor)</td>
</tr>
<tr>
<td>0</td>
<td>No area under rabi cultivation</td>
</tr>
</tbody>
</table>
16.6.1. **Hinjili Block**:

The monotonously level terrain over most of the Hinjili block provides for a potential base for agricultural land utilisation. The extensive crop-use of this block is aptly supported by the other favourable components like soil and water. Despite more or less adverse social impacts, the Hinjili block extends a large hold on the total crop products in the Chhatrapur Subdivision.

The overall pattern of agricultural landuse distribution among the panchayats of Hinjili block is more or less uniform (Appendix III), because the agricultural operation is the largest single industry here. In terms of kharif cultivated area in per cent to the panchayat area (Appendix III) the rich cultivated class above 80% (Fig. 16.1) covers the panchayats of Burupada, Sasana, Sikiri, Kharida, Putiapadar, Gandala, Belagam, Bhabandha and Makarjhol. The moderately rich class in this respect includes Nandika, Saru panchayats and Hinjili NAC. The panchayat of Sahapur Constitutes the moderate class while Ralab and Chanduli panchayats fall under moderately poor and poor classes (Fig. 16.1) respectively.

Above 90% of the panchayats of Hinjili block where, the dominating crop is paddy. The low-lands and medium lands of these panchayats are devoted to the growing of mainly
paddy besides other secondary crops. The panchayats of Burupada, Sahapur, Sasanambagan, Sikiri, Nandika, Putiapadar, Ralaba, Gandala, Belagam, Bhabanada, Durubandha, Suru, and Makarjhol panchayats account for more than 80% of their cultivated lands to paddy. In this category of paddy lands in Hinjili block the panchayat of Sahapur alone shows an almost uniform distribution of high land (32.28%), medium land (26.42%) and low-land (4.13%) paddy-use owing to the availability of potentials in respect of soil and water besides other infrastructural inputs.

The panchayats of Kharida, Hinjili NAC, Darubhadra and Badakhandi account for 61 to 70% per cent of their cultivated lands as paddy growing tracts. The minor topographical ruggedness and nearly level conditions lead to predominantly paddy growing in these parts of Hinjili block. The only panchayat of the Hinjili block to fall under the moderate category (61-70%) is Chanduli (69.40%) which accounting for 20.82% of its paddy land on high, 47.64% on medium and 31.54% on the low-land. The other categories of moderately poor and poor show no occupancy.

During the rabi season we see a marked deviation from the landuse trend of the kharif. Apart from water availability factor, the land, used more than once, has been seriously threatened by the social factors. With all forms of water
and soil potential available in Hinjili block, Ralaba is the only panchayat which contributes more than 30% (Fig.16.3) of its panchayat area to rabi cultivation which is 57.58% of its total cultivated area. Further, Ralaba and Sikiri panchayats are noted for extensive production of the commercial betel leaves all the year round on their perennially irrigated sandy loam soil surfaces. Rest of the panchayats of Hinjili block virtually fall under the 25 per cent and less category of area under rabi landuse.

16.6.2. Khallikote Block:

The influence of terrain can explicitly be observed from the bigger size of the plots and the pattern of distribution of agricultural land utilisation in the Khallikote block. Flat lands of high agricultural value are rarely observed while hills and uplands are the common terrain phenomena associating ruggedness. A part of the level terrain unit comes under the sub-terranean saline ingress. The block is represented by a greater degree of surface roughness with its accompanying gullied low level lateritic surfaces of very poor soil water conditions and poor underground water resource.

In addition to the Eastern Ghats of the northeast, the terrain of Khallikote is dotted with innumerable hills and
hillocks at regular intervals on space (Fig. 3.1). The rugged units of the Khallikote block are also scattered all over the landscape in a similar manner as those of the hill units. The rugged units of the block under study cover the panchayats of Badapali, Bhikapada, Langaleswar, Koirasi, Kanheipur, Pathara, Bikrampur, Keshpur, and Aitipur in the north and northeast; Talapada, parts of Chikili and Kumondo panchayats in the south-central parts of the block. The influence of ruggedness has been observed in parts of Badapalli, Kumondo and Chikili panchayats where the cultivated area in per cent to the panchayat area varies from much less than 50% to little more than 70%. The operational efficiency relating to agricultural landuse is confined mostly to the high land and medium land paddy regions.

The upland moderately sloping units associated with the conspicuous hilly and more or less rugged surfaces, and cover the western half of B.N.Pali and parts of Khallikote panchayats where the rainfed cultivated tracts account for more than 80% of the total panchayat area, of which the paddy lands account for 41.64% and 79.87% respectively. The landuse operations are seemingly confined to the medium and low-lands where groundunt, chilli, til, ragi and sweet-potato constitute the secondary kharif crops.
The nearly level land units of Khallikote block comprises the parts of B.N.Pali, the whole of Tulasipur, part of Mathura, Chikili and Subulia and low undulating lacustrine low-lands of the southeastern Kanka panchayats. The cultivated lands in these parts in per cent to the panchayat area is invariably more than 80%. Paddy being the main crop, the paddy land of these panchayats account for roughly little more than 70% (Appendix III) of the cultivated area which is divided into almost equal proportions among the high, medium and low paddy lands.

The level lands of the Khallikote block in the strict sense of the term consist of Kanchana, Naikanipali, parts of Danapur, B.N.Pur and southwestern Kumondo, Dimiria and parts of northern Kanka. These are mostly the low upland plains with their characteristic hard khondalitic and lateritic surface expressions (Fig.7.1). The cultivated tracts in these panchayats account for more than 60% (moderate) of their panchayat area of which the khari f paddy lands contribute little less than 60% to little over 70% of the total cultivated area.

Owing to the complex terrain conditions of relief, geolithological and pedo-hydrological constraints and an exclusively rainfed nature of the cultivable terrain utilisation, the area under rabi in proportion to panchayat area is very
low registering a recorded low of much less than 25% in all panchayats of the Khallikote block.

16.6.3. Kodola Block:

The internal economy of the Kodola block, as similar to other blocks of the Chhatrapur Subdivision, is dominated by agriculture and is the mainstay of the bulk of its population. About 77.86% of the grampanchayat land of the block is under cultivation. **Kharif** cultivation being the chief, food cropping especially of paddy is predominating the agricultural landscape. The paddy lands account for 69.88% of the total cultivated area. Other main crops in descending order are pulses, ragi and other root crops. Owing to the availability of irrigation, **rabi** is more important in one or two panchayats of Kodola block (Appendix III) while **kharif** is everywhere more important. The agricultural landuse statistics in respect of this block, though mostly homogeneous in distribution, exhibit more or less improper utilisation. This is due to the limitations of uncompromising environmental characteristics of each panchayat. Such problems are clearly related to erosion, deforestation (Ch.6), steep gradients, high surface elevations, rugged and upland plateaus, hills and rainshadow conditions and deep underground water table. The social constraints in this respect is no less significant so far as the attitude of land owners and land fragmentation in the block are concerned.
Almost the entire eastern half of Angargam, southeastern one quarter of Burujhari and northern Kalimeghi panchayats are characterised by the unfriendly hill and forested units showing no agricultural landuse operation.

The rugged terrain of Kodola block traverses through the western Talasara, Badakhirakhama, northwest Chingudikhol, northeastern Mardakote panchayats, Mathasarsing, parts of Digapada and Beruanbadi. The agriculture in these panchayats is purely rainfed. Owing to the lack of potential availability of surface water, the agricultural land in these parts is not subjected to any agricultural use more than once. Kharif cultivation in these panchayats exceeds over the rabi with an areal occupancy of more than 60% of the panchayat area. Paddy lands of Kodola block in fact lead the cropuse sequence by holding more than 70% of the total cultivated area.

The Saurachachina and Kedarida panchayats represent the true upland characteristics in the Kodola block the landscape segments of which are readily visible to any field researcher on his way from Beguniapada village to the village of Angargam. These upland units also include parts of northeastern Sumandal and parts of Burujhari. The soil surfaces are mostly of coarse sandy and ferruginous, and clay. Except Sumandal panchayat the potential availability of water is a far cry. Under this hostile terrain constraints and waterlessness, the agriculture
is indispensably rainfed. *Kharif* cropping is dominating while paddy dominates the cropping pattern. The cultivated area in these panchayats occupy more than 80% of the panchayat area to which the paddy lands contribute more than 60%. The secondary crops of this cropping pattern consist of ragi and til.

The level lands in the Kodola block extend into a narrow belt covering a major part of Angargam, central Talasara, Sandhamul, parts of Saurachachina, Chingudikhol, K.Barida, Khandianai, southeastern Mardakote, Beguniapada, Mardamekha, southeastern Kodola, Phasi, southeastern Digapada, southern three-fourth of Kalimeghi, northwestern Mathasarsing and parts of Beruanbadi panchayats. The conspicuous flatness of the terrain varies in the surface elevation from less than 15 metres near the Beguniapada, Khandianai and Phasi panchayats to more than 100 metres near Saurachachina and Sandhamul panchayats. The landscape consists of varying ranges of lateritic to coarse sandy and red ferruginous clay surfaces. The river Kharkhari and Jagatinadi virtually control the overall agricultural status of these panchayats. The *kharif* cultivation accounts for more than 80% of the panchayat area in most of the panchayats. Excepting the panchayats of Phasi and Beguniapada the density of fallow and other cultivable waste lands is beyond expectation in other panchayats. The cropping
pattern is dominated by paddy which accounts for more than 70 per cent of the cultivated area in almost all panchayats of the level cultivated terrain of the Kodola block.

Owing to the negative social response, the productive tracts of Phasi, Deguniapada and Sumandal panchayats contribute no productive areal occupation to the rabi cultivated area. The panchayats of Angargam, Mathasarsing, Khandianai, Mardakote, Kalimeghi and Kodola account for no recorded figures in respect of their area under rabi (Appendix III). Owing primarily to the non-availability of irrigation water and poor social response, Beruanbadi, Digapada and Badakhairakhama panchayats fall under moderate category relating to the rabi cultivated area while the rest of the panchayats register a recorded low of less than 25%. The rabi cultivation in these parts of the Kodola block includes some pulses, oil-seeds and variety of vegetables.

16.6.4. Polosara Block:

The terrain of Polosara block displays a distinct landscape representing hilly, rugged and undulating topography, innumerable swift flowing ephemeral streams, large uninhabited tracts. Its eastern part is defined by the Eastern Ghats. It is drained by the river Dhanei. The dense vegetal cover in the east distinguishes itself from the western cultivated
uplands and nearly level plains drained by the Bhaguva river. The terrain of Polosara is characterised by black clay and lateritic soils of low fertility. Since cultivation is the main occupation here, about 74.89% of its total panchayat area, of which 69.13% is under paddy lands. Other important crops are ragi, \textit{til}, maize, sugarcane, oil-seeds and pulses.

The agriculture in the Polosara block is still in an awe-ful state not only because of the tradition-ridden human attitudes, but also because of the adversity that is associated with the terrain of the Polosara block at large.

The Eastern Ghat region of the Polosara block constitutes the two panchayats of Gochhabadi and Pandiripada. The lateritic soil surfaces and bare rocky outcrops dotted with innumerable gullies are the characteristic forces behind severe soil erosion in these parts. Cultivation, chiefly of paddy, is the main occupation of these acidic soil surfaces mostly underlain by the hard clay pans. The cultivated area in the two panchayats of this region accounts for 81.84% and 78.68% respectively of which the paddy lands of Gochhabadi contribute 75.65% and of Pandiripada panchayat account for 66.81%. The \textit{rabi} cultivation in these tracts is characterised by \textit{til}, groundnuts and sweet potatoes.

The panchayats of Sodoka, Hatioto, Kalambo, northwestern Khanduru, northwestern Balichai, Southern half of Rumagad and
southern Mathura constitute the hard lateritic surface of a very rugged terrain of Polosara block. The water table is generally very deep. Most of the available shallow underground water is, however, brackish and unfit for cultivation. The cultivated areas in these panchayats fall under the moderate (61-70%) category. The panchayats of Mathura, Kalambo, Khonduru and parts of Sodoko present their land under paddy which account for more than 80%, while other panchayats of the rugged terrain of Polosara block contribute much less than 50%.

The parts of Rumagad, Mathatentulia, Chirikipada, Badapankalabadi, Madhupali, Bellagam, Polosara, northern Mathura, southeastern Khonduru, eastern half of Jakkarao constitute the moderately sloping upland terrain unit of the Polosara block. The soil surfaces in these parts vary from stiff and light clayey to red ferruginous and sandy loamy. The soils of these panchayats are comparatively deep and fertile while the ground water is still brackish. Availability of the Dhanei canal water is quite significant in these panchayats especially during the kharif. Paddy is still the primary crop of the sequence of cropping here. The cultivated tracts of these panchayats account for nearly more than 80% of the panchayat area while the proportion of paddy lands in relation to the cultivated area is moderately high (61-70%). The panchayats of Mathatentulia, Chirikipada and Mathura grow extensive sugarcane, maize and vegetables after the paddy growing.
The nearly level lands of the Polosara block comprising the panchayats of Dhunkapada, northern Kanochai, southeastern Balichai, southern Ghodapalan and western Jakkar are characteristically the inherited surfaces of the adjacent uplands. Parts of these panchayats fall under the inter-fluvial ridges of the Shaguva and Dhanei rivers. The micro-geomorphic phenomena of these tracts are represented by the finger gullies and imperceptible soil loss. The cultivation in these parts are confined to the valley-side uplands. The soil sequence of this region consists of stony and gravelly sand to sandy loam, sandy clay and clay. The cultivated tracts in these panchayats in per cent to the panchayat area is slightly more than 60% of which the predominating paddy lands account for 70 to 80% or more especially during kharif.

A part of the southeastern Mathura falls under the level land of Polosara block. The red sandy loam surfaces with low dependable water table and availability of surface irrigation led this panchayat to account for 85.05% of its panchayat area as cultivated of which 72.94% is under paddy.

During the rabi season, excepting the panchayats of Belagam (23.33%), Ghodapalan (4.82%), Rumagad (0.91%), Hatioto (0%), Dalichai (1.48%), Khonduru (24.38%), Polosara (14.67%), Mathura (11.85%) and Jakkoro (16.60%), all panchayats of Polosara contribute much more than 30% (Appendix III) of the panchayat
area as rabi cultivated. Owing to the availability of winter rains and irrigation water, the extensively fragmented agricultural plots of these panchayats grow extensive pulses and vegetables. The conspicuous rabi cropping pattern of these panchayats is characterised by the Pulses-Vegetables-Ragi-Oilseeds-Dhanicha.

16.6.5. Purusottampur Block:

The Purusottampur block is a well-demarcated terrain complex of all five major categories of terrain units (Ch.12 & Fig.12.1). A contiguous level tract dominates the terrain complex of the block and associated mostly with rich water resource and soil potential. A part of the northwestern Purusottampur block is represented by the rugged upland and undulating subdued relief with accompanying problems of soil erosion in the panchayats of Badakharida and Bhutasarsing and parts of Boxipali, Arakhpur and Sikula. Agriculture is the predominant occupation with paddy as the main crop in the block. Owing to the sandy clay, loam and silty clay soils many parts of the block are double cropped. The lateritic and red soil regions in the north and northwest have, however, been given to mono-paddy cropping only. The predominance of kharif cropping is noticed in almost all panchayats. The cultivated area in percent to the panchayat area is 78.53%, of which the paddy lands account for 80.08% in the Purusottampur
block. In so far as the agricultural landuse efficiency of the Chhatrapur Subdivision is concerned, the Purusottampur may be ranked as a close second to the Hinjili block in terms of agricultural production.

The hilly terrain in the form of residual hills covers a large part of Bhutasarsing panchayat of the Purusottampur block. This tract is invariably wooded with dense scrubs and afforested species of neem. These units offer no any scope even for future use with regard to agriculture.

The rugged plateau surfaces and rugged low undulating lands in parts of Sikula, Jaganathpur and the whole of Arakhpur panchayat are predominantly paddy growing tracts. Some residual hillocks with gullied bases and other undulating plateau surfaces, which are characterised by the coarse sandy and lateritic soils. Agriculture is the dominant occupation. In percent to the total panchayat area the kharif cultivated area is between 71-80% (moderately rich), of which the paddy lands account for more than 80% of the total cultivated area.

The northern half of Badakharida panchayat comes under the isolated hillocks and lateritic soil surfaces with little or no agricultural value. The nearly level lands of the Bhutasarsing panchayat, however, have been put to cultivation and accounting for 76.28% of which 58.17% is under paddy. The agricultural landscape of the panchayat is characterised by
kharif cropping only. A large extent of fallow lands is a common observation. The availability of irrigation is confined to the saucer shaped low-lands between two opposite nearly level surfaces.

All other panchayats excepting Arakhpur, constitute vast stretches of level lands having fertile soil surfaces and more or less perennial irrigation water availability. Most of these panchayats have been served by the segment canals of the river Rushikulya and Ghodahad. The state of ground water table is dependable throughout the year. The panchayats of Tankachai, Jhadabai, Antrigam, Pandia, Purusottampur, Bhimpur, Handighar, Pratapur, K.N.Pur, and Ranajhali are directly served by the Rushikulya river and, therefore, double cropping is a very common agricultural practice in these panchayats. The chief crop being paddy, the other important secondary crops of these panchayats consist of pulses, ragi, oil-seeds, vegetables and commercial betel leaves in both kharif and rabi seasons. In percent to the panchayat area the high cultivated class constitutes the parts of Antrigam, Pratapur, Badakharida, Bhatakumarada, Soma, Baghala, Badabaragam, Bhimpur, Handighar, Gangadeuni and Purusottampur, while Sikula, Pandia, K.N.Pur, Sunadhara, Jamuni, Ranajhali, Jhadabai and Ch.Nuagam constitute the moderately rich (71-80%) cultivated class. The Raipur and Jaganathpur panchayats come under the moderate category (61-70%). The optimisation in respect of agricultural
landuse capacity is still below the level of expectation considering the predominance of agriculture in the regional economy because of a set of social constraints and physical debility relating to land ownership, per capita land availability, unscientific landuse operation, and rural overcrowding and flood hazards.

In per cent to the total cultivated area, the paddy lands in the panchayats of Sikula, Pandia, Pratapur, K.N.Pur, Sada-kharida, Soma, Sunadhara, Baghala, Badabaragam, Bhimpur, Handighar, Gangadeuni, Tankachai and Purusottampur constitute the rich cultivated class. The moderately rich class in this respect consists of the panchayats of Raipur, Bhatakumarada, Jamuni, Ch.Nuagam and Jaganathpur, while the panchayats of Antrigam, Ranajhali and Jhadabai constitute the moderate class (61-70%).

Owing to the availability of lift irrigation and flow irrigation, the agricultural landuse operation during rabı season is equally significant as the kharif. Excepting the panchayats of Bhutasarsing (28.72%), Bhatakumarada (27.79%), Jhadabai (29.94%) and Jaganathpur (19.50%), the rabı cultivated area in per cent to the panchayat area in all panchayats account for much more than 30% (moderate). A greater impact of social undercurrent seems to operate in Jaganathpur panchayat besides its physical constraints of soil erosion
and unscientific farming operations. The loss of water level in the segment canals has, however, adversely affected the magnitude and extent of rabi crop-use in Bhatakumarada and Jhadabai panchayats while the panchayat of Bhutasarsing remains as usual a problem patch of the Purusottampur block awaiting effective landuse and soil-use planning.

16.6.6. Ganjam Block:

Despite large area under cultivation, the agricultural landuse operational efficiency of the terrain of Ganjam is seemingly low. It has been observed during field investigation and concluded by the author that the terrain of Ganjam, with its all environmental diversities relating to undulating terrain, residual hills, spurs, diversity in slope and relief, varying lithology, littoral, lacustrine, riverine and estuarine characteristics, imposes serious limitations and are not always amenable to irrigation. The soil surfaces over three-quarters of Ganjam block are less water retentive. The level stretches of land are mostly confined to the riverine tracts of Karapada and Aliabad villages in the southwest. Kharif cultivation is dominant and the paddy being predominant. The cropping pattern consists of paddy-pulses-ragi-vegetables-chilli-betel leaves. The cultivated area in per cent to the panchayat area in kharif is 57.54% while the rabi cultivated area is 7.69%. The kharif paddy lands account for 53.07% of the cultivated area.
The panchayat conforming to the non-littoral, littoral and lacustrine characteristics together is Sanramchandrapur which contributes only 34.54% of its panchayat area to cultivation, of which only 24.97% is under paddy lands. Similarly the area under rabi is 9.58%. The northwestern Humma and Khandadeuli panchayats and parts of Ganjam town constitute the rugged landscape of the Ganjam block. Owing to the scarcity of underground water and lateritic soil surfaces and saline tracts of Chilka lake the panchayat of Humma concentrates more on the salt resistant paddy, chilli and salt manufacturing (Plate 3.3). The cultivated area in percent to panchayat area is 74.99% of which the proportion of paddy land is 72.50% while area under rabi is only 11.63%. The Khandadeuli panchayat with its conspicuously rugged, hilly, upland, low undulating terrain conditions and deep ground water table surfaces account for 80.45% of its panchayat area to cultivation. The paddy lands of the Khandadeuli panchayat account for only 47.54% of the cultivated area distributed mostly among its medium (52.98%) and low paddy lands (39.72%). The area under rabi is only 6.73% in this panchayat.

The Pallibandh and Rumagad panchayats in the southern littoral and marine-lacustrine level lands of the Ganjam block show a poor account of agricultural landuse owing to the coarse soil surfaces, bare rocky outcrops (Palur hills),
subterranean saline water table. The cultivated areas in Pallibandh and Rumagad panchayats in per cent to panchayat area are 66.53% and 40.38% of which the percentages of paddy land are 83.29% and 39.95% respectively. While the littoral panchayat of Pallibandh is characterised by the rabi fallow lands, Rumagad panchayat grows some rabi vegetables on its total rabi cultivated area of 97.78 hectares.

With all terrestrial and aquatic distinctnes the wide stretches of level lands of Ganjam block consist of the southwestern half of Santoshpur, Malado, Kainchpur, Ganjam town, Karapada, Rajapur, Poirasi and Rambha panchayats. Parts of Rambha and Poirasi panchayats are partly rugged. Similarly a major part of Santoshpur panchayat consists of the Chilka low uplands. In the context of agricultural efficiency, Rajapur and Karapada panchayats rather lead the block in yield per hectare and importance. The soils of these two panchayats are rich silty loam to loamy clay and sandy loam with extensive availability of surface irrigation water through the Jaymangala and Rushikulya canals. The underground water table in these panchayats is deep and brackish. The crop sequence in Karapada and Rajapur is represented by Paddy-Pulses-Betel leaf-Vegetables. The other panchayats of the level land in Ganjam block practise only paddy growing.
In terms of percentage of panchayat area the rich agricultural landuse class consists of Kainchpur, Rajapur, and Santoshpur level lands. The moderately rich class (71-80%) covers the panchayats of Ganjam, Humma and Karapada. The panchayats of Pallibandha, Poirasi an Rambha constitute the moderate class (61-70%) while the Malado panchayat constitutes the moderately low class. The dominant crop, i.e., paddy accounts for more than 80% of the cultivated area in the Kainchpur, Pallibandha, Rajapur, and Rambha panchayats. The panchayats of Humma and Karapada account for a moderately rich class (71-80%). The moderate paddy landuse class (61-70%) consists of Poirasi panchayat only while all other panchayats of Ganjam block constitute the low paddy landuse class of less than 50% of the total cultivated area.

Owing to the predominance of kharif cropping and the conspicuous terrain environmental constraints the area under rabi cultivation in per cent to the panchayat area in all panchayats of the Ganjam block is very low (Appendix III) excepting the Karapada panchayat which accounts for 26.19% (moderately low). No part of the panchayat area has been brought under the rabi cultivation in the panchayats of Pallibandha, Poirasi and Ramgad owing to the non-availability of irrigation water during rabi season.
16.6.7. Kavisuryanagar Block:

The terrain of Kavisuryanagar block is characterised by a remarkably undulating surface dotted with a number of residual hilly uplands in the northwest made up of both Archaean and Khondalitic rocks. Besides old and recent alluvium, the soil surfaces are notably of clay. The sandy clay and loam surfaces are confined to the south-western level lands. The physical landscape of Kavisuryanagar has been traversed by Bhaguva and Dhaneti rivers at right angles to the south-southeast flowing Rushikulya river.

It will be seen (Table 16.1) that 14467.70 hectares (86.61%) are devoted to growing crops of various kinds. The kharif growing, notably paddy, is important. The paddy lands of the Kavisuryanagar block constitute 68.29% of the cultivated area, of which high, medium and low lands account for 28.44%, 41.57% and 29.99% respectively. The area under rabi in per cent to the panchayat area of the block stands at 59.26% which is confined to the favourable tracts of potential water availability. It may be noted that in spite of a conspicuous regional variation in the terrain conditions, the pattern of agricultural landuse distribution in the Kavisuryanagar block is more or less homogeneous (Appendix III) owing to the fact that agriculture is the largest single economic occupation for both sustenance and sale.
The residual rock out-crops and hills in parts of Athgarhpatna, Gudiali, Budhambo, Badamahuri panchayats and Kavisuryanagar town area offer no scope for agricultural landuse operations owing to the thin soil cover, steep land-gradient and occasionally dense vegetation.

The rugged landscape of the Kavisuryanagar block comprises Subulia and Jharada panchayats. Although the landscape is rugged the cultivation is seemingly a forceful occupation. In per cent to the panchayat area the cultivated area of both Subulia (94.75%) and Jharada (94.14%) account for more than 89% of which, the paddy lands constitute 68.83% and 80.03% respectively. In both the panchayats the role of negative social factors in clamping the extension of agricultural landuse cannot, however, be ruled out.

A major part of Athgarhpatna, Budhambo and Badamahuri constitute the moderately sloping upland terrain of the Kavisuryanagar block (Fig.12.1). While the soils of the Althgarhpatna panchayat are stiff clay, the soils are lateritic and red ferruginous and stony in the budhambo and Badamahuri panchayats. The ground water table is deep and brackish in the later while the former presents stable ground water conditions. The bulk of their cultivated tracts is provided with the rain-fed tank irrigation. In per cent to the panchayat area, the cultivated tracts of Athgarhpatna
accounts for only 57.97% owing to their upland wooded nature of the terrain to a large extent. Budhambo (99.61%) and Budamahuri (89%) account for more than 80% of their panchayat areas as cultivated. The proportion of paddy lands constitute 61.35% in Atngarhpata, 88.01% in Badamahuri and 60.97% in Budhambo of their cultivated areas.

The nearly level terrain virtually determines the terrain personality and identity of the Kavisuryanagar block constituting parts of Ambapua, Kaniari, Borasingi, Paikajamuna, Nandigodo, Sialia, Sunapali, Baunsia, Kavisuryanagar, Baliasara, Gudiali, Ganganpur and Barida panchayats. In per cent to the panchayat area, the rich agricultural landuse class (over 80%) covers almost all of these panchayats except the panchayat of Borasingi (79.71%). This is quite evident from the data that agriculture is the foremost occupation of these panchayats. Further, due to their low undulating lands, fertile clay and sandy clay soils, potential water availability these panchayats grow a variety of pulses, oil-seeds, vegetables besides paddy. The rich paddy land class (Above 80%) comprises the panchayats of Ganganpur, Nandigodo, Borasingi and Baliasara panchayats while the panchayats of Ambapua and Sialia constitute the moderately rich class (71-80%). The moderate class (61-70%) constitutes Paikajamuna, Baunsia, Sunapali and Kavisuryanagar panchayats and the moderately poor class (51-60%) covers the panchayats of Barida, and Gudiali while
the panchayat of Kaniary (31.85%) constitutes the low paddy landuse class.

A very tiny patch of level land constituting the Belasara Panchayat is situated in the southwest of the Kavisuryanagar block the southwestern fringe of which is defined by the left bank of the Rushikulya river. The soils are silty sandy clay and are exposed to annual flood hazards. In per cent to the panchayat area the cultivated land of the panchayat of Belasara is 68.36% of which the paddy lands constitute 49.32%.

Owing to the availability of irrigation water most of the panchayats of the Kavisuryanagar register 30% (moderate) in respect of the area under rabi cultivation. The cropping pattern is dominated by extensive sugarcane, maize and chilli. The rabi cultivation seems proportionately to exceed kharif cultivation (Table 16.1) of the Kavisuryanagar block.

16.6.8. Chatrapur Block:

The regional economy of the Chatrapur block is dominated by agriculture which combined with other non-agricultural activities. As the District/Subdivision/Tahsil/Block headquarters Chatrapur town is centrally situated in the Chatrapur block, the semi-permanent rural migration to this town at the cost of agricultural occupation is a very significantly adverse element of agricultural landuse in the block. On the other hand the social factors of land fragmentation and
attitude of land ownership play again a negative role in the expansion and intensity of agricultural landuse in the Chatrapur block. Above all, the dominant feature of agriculture is its diverse physical environment. The southern one quarter of the block is defined by the littoral low-lands of little or no agricultural value. The regional litho-structural constraints impose certain degree of restrictions on the productive landuse pattern. The loamy and clayey soils are found in the non-littoral valleys and depressions. The complex relief zones (Fig.9.5) are covered by high and low level lateritic and ferruginous red soils. The underground water table is very deep below the hard khondalitic rock basement. Therefore, about more than 90% of the wells in the Chatrapur block go dry after December. These non-littoral tracts of Chatrapur block may undeniably be called a water scarcity/deficit/water-less terrain of the Chhatrapur Subdivision. As far as the canal irrigation of the block is concerned, the segment canals of the Rushikulya canal irrigation system are severely silted and, therefore, lose contact with the reservoir especially during the kharif sowing.

The littoral low-grounds of the Chatrapur block with their characteristic dependence upon agriculture is hampered to a very large extent by the environmental constraints that are universally common to any coastal borderland region of India.
It may, therefore, be noted that the terrain of the Chatrapur block has a definite bearing upon the agricultural landuse pattern. The cultivated area in per cent to the panchayat area of the block is only 47.94% of which the paddy lands account for 60.56%. The area under rabi is merely 1.83% of the panchayat area of the Chatrapur block. Thus kharif cropping, chiefly paddy, is dominant so far as the agricultural crop-use of the block is concerned.

The hilly and rugged tracts form quite insignificant parts (Figs.3.1 & 12.1) of the Chatrapur block. The proper Chatrapur town and its agricultural hinterland constitute an upland terrain. The conspicuous kharif cultivation upon the lateritic soil surfaces of the hinterland depends on the nearby Humuri Tampara fresh water swamp for irrigation. The cultivated area in per cent to the total area of Chatrapur hinterland accounts for only 12.87% of the total municipality area constituting the kharif vegetable growing tracts.

The nearly level and low undulating lands of Chatrapur block cover the panchayats of Kaliabali, Chamakhandi, Laxmipur and Bhikaripali. The physical landscape of these panchayats are characterised by irregular rugged patches and bare rocky outcrops, residual hills, lateritic surfaces and miniature gullies. The underground water table is deep, while the canals provide no desirable amount of water for irrigation.
The large swampy depression called Tampara near the Patapur village of this terrain is too saline to be used for any agricultural use (Plate 5.3). The long pipe line from Badamadhopur on Rushikulya to the Indian Rare Earth Complex at Kaliabali releases some amount of potential water (Plate 6.2) to the cultivated tracts in these parts of the Chatrapur block. In terms of the cultivated area in per cent to the panchayat area, the panchayats of Kaliabali, Chamakhandi, Laxmipur and Bhikaripali account for 28.23%, 55.78%, 78.84% and 48.72% respectively. The proportion of paddy land in relation to the cultivated area the panchayat of Kaliabali singularly contributes as high as 96.60% (rich) which is followed by Chamakhandi with 61.51% (moderate), Bhikaripali with 42.31% (poor) and Laxmipur with 40.66% (poor).

The panchayats of Badamadhopur, Patlampur, Baulagam, Bipulingi, Chikalkhandi, Podapadar, Tanganapali, Kanomona, Narendrapur and Sundarpur constitute the level terrains of the Chatrapur block. There are minor instances of low intensity ruggedness, isolated low uplands and low undulations on these level lands. Agriculture is the primary occupation of these panchayats and paddy is the chief crop. The intensity and expanse of the agricultural landuse is considerably influenced by the adverse social attitude, non-negotiable geo-lithology and the adverse environmental conditions of the coastal characteristics. Excepting the riverine panchayats
of Badamadhopur and Patlampur, the soils of most of these panchayats are characteristically lateritic and red sardy with low fertility status. Further, the soils are either silty or muddy clay or marine sandy in the panchayats of the littoral tracts. The fertile soil surfaces of Baulagam, Badamadhopur and Patlampur consist of sandy loam, sandy clay and loamy clay. The over-all cropping patterns of these panchayats are dominated by the paddy lands while the secondary crops consist of pulses, rigi, oil-seeds and vegetables. The kharif cropping exceeds the rabi cropping in these panchayats of the Chatrapur block.

In per cent to the panchayat area the rich cultivated landuse class (Above 80%) includes the panchayat of Baulagam only while the panchayats of Birlungi and Patlampur constitute the moderate class (61-70%). The panchayat of Narendra-pur constitutes the moderately poor class (51-60%). The rest of the panchayats of the level terrain including the Badamadhopur panchayat fall under the poor class less than 50% (Fig.16.1). The fertile tracts of the Badamadhopur panchayat reveals poor class (less than 50%) owing definitely to the negative social factors.

In a similar manner the paddy lands in the panchayats of Tanganapali, Kanomona, Chikalkhandi, Podapadar and Kaliabali account for more than 80% (rich) of the total cultivated area.
The moderately rich class (71-80%) covers the level lands of Sundaipur and Baulagam panchayats while the panchayat of Patlapur constitutes the moderately poor (51-60%) class. The rest other panchayats constitute poor class (< 50%) in this respect.

The area under rabi (Appendix III) is observably insignificant in all panchayats of the Chatrapur block accounting for much less than 25% (poor class) owing to the non-availability of water during the rabi months.

Since agriculture is the single largest occupation in all blocks of the Chhatrapur Subdivision, the conspicuous agricultural landuse occupancy under different crops needs extension and intensification in order to meet the growing demand for food crop. Therefore, an effective agricultural landuse planning in the proper regional physical and socio-cultural and economic perspectives is indispensable in the Subdivision of Chhatrapur.