CHAPTER IV
CROPPING PATTERN AND CROPPING INTENSITY

Cropping Pattern has been defined as the proportion of area under different crops at a particular period of time. A change in the cropping pattern means a change in the proportion of area under different crops. The study of cropping pattern is necessary for preparing a rational and balanced plan for cultivation of such crops which would give maximum returns with minimum inputs to meet the requirements of food for the people and raw materials for industry in the state. The crop pattern of any region or the country is mainly influenced by natural, social, historical and economic factors. In addition, the government can also effect changes in crop pattern through its agricultural policy. In this context, the National Commission on Agriculture also pointed out that “the Cropping Patterns depend primarily on soils and Climatic factors, but as they evolve, also represent the integrated effect of the requirements, local habits and economic factors through time.”¹ The analysis of the cropping pattern is necessary for an identification of the major crops

that are grown in the state. Further any change in the cropping pattern may reflect the influence of demand arising from an increase in the level of income and also because of the development of agro-industries. Historically there has been a strong positive correlation between the levels of economic development and the extent of commercial cropping. Food crop predominance is usually associated with subsistence farming cropping pattern.

A study of cropping pattern would bring out the proportion of area under different crops at a point of time. Cropping pattern in the state keeps on changing from time to time in consonance with change in agricultural prices, government policies and other related factors. Due to various development programmes undertaken by the government, crop production patterns have undergone change.

Table 4.1. shows the cropping pattern of the valley areas of Manipur for the period from 2000-01 to 2010-11. The trend of total cultivable areas by different crops is erratic and irregular. In 2000-01 the total cultivable area was estimated to 149.7 thousand hectares which sharply felt to 109.72 thousand hectares is 2002-03 and again rose to 152.89 thousand hectare in 2003-04. With a minimal fall to149.2 thousand hectares in 2005-06 it rose to 167.04 thousand
TABLE NO.4.1.

CROPPING PATTERN OF THE VALLEY AREAS OF MANIPUR (‘000 hectares)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cereals (‘000)</th>
<th>Pulses (‘000)</th>
<th>Oilseeds (‘000)</th>
<th>Sugar cane (‘000)</th>
<th>Potato (‘000)</th>
<th>Total Valley (‘000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>121.39 (81.09)</td>
<td>8.95 (5.98)</td>
<td>12.78 (8.54)</td>
<td>2.61 (1.74)</td>
<td>3.97 (2.65)</td>
<td>149.7</td>
</tr>
<tr>
<td>2001-02</td>
<td>118.12 (81.16)</td>
<td>10.84 (7.49)</td>
<td>9.36 (6.47)</td>
<td>2.64 (1.82)</td>
<td>3.77 (2.60)</td>
<td>141.73</td>
</tr>
<tr>
<td>2002-03</td>
<td>81.69 (74.45)</td>
<td>9.31 (8.49)</td>
<td>12.27 (11.18)</td>
<td>3 (2.73)</td>
<td>3.45 (3.14)</td>
<td>109.72</td>
</tr>
<tr>
<td>2003-04</td>
<td>118.47 (77.66)</td>
<td>12.23 (7.80)</td>
<td>15.17 (9.92)</td>
<td>3.43 (2.24)</td>
<td>3.32 (2.17)</td>
<td>152.89</td>
</tr>
<tr>
<td>2004-05</td>
<td>118.11 (78.15)</td>
<td>12.56 (8.31)</td>
<td>13.81 (9.14)</td>
<td>3.45 (2.28)</td>
<td>3.21 (2.12)</td>
<td>151.14</td>
</tr>
<tr>
<td>2005-06</td>
<td>112.75 (75.57)</td>
<td>15.56 (10.43)</td>
<td>14.04 (9.41)</td>
<td>3.61 (2.42)</td>
<td>3.24 (2.17)</td>
<td>149.2</td>
</tr>
<tr>
<td>2006-07</td>
<td>119.41 (75.80)</td>
<td>13.26 (8.42)</td>
<td>17.19 (10.91)</td>
<td>3.76 (2.39)</td>
<td>3.92 (2.49)</td>
<td>157.54</td>
</tr>
<tr>
<td>2007-08</td>
<td>126.48 (75.72)</td>
<td>13.51 (8.09)</td>
<td>17.57 (10.52)</td>
<td>4.08 (2.44)</td>
<td>5.4 (3.23)</td>
<td>167.04</td>
</tr>
<tr>
<td>2008-09</td>
<td>126.84 (74.59)</td>
<td>14.08 (8.28)</td>
<td>18.43 (10.84)</td>
<td>4.34 (2.55)</td>
<td>6.36 (3.74)</td>
<td>170.05</td>
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<tr>
<td>2009-10</td>
<td>84.26 (52.34)</td>
<td>32.53 (20.21)</td>
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<td>6.92 (4.30)</td>
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<td>2010-11</td>
<td>129.8 (75.01)</td>
<td>14.84 (8.58)</td>
<td>17.73 (10.25)</td>
<td>4.43 (2.51)</td>
<td>6.33 (3.66)</td>
<td>173.04</td>
</tr>
</tbody>
</table>

Source: Department of Agriculture, Government of Manipur
hectares in 2007-08 and further to 170.05 thousand hectares in 2008-09. However it fell to 160.98 thousand hectares in 2009-10 and again rose to 173.04 thousand hectares in 2012-11. As already mentioned, the state’s agricultural activity depends mainly on monsoon and net irrigation facilities in terms of canals, tube wells and ponds are very limited in comparison with other states. If there is timely monsoon and good rainfall the agricultural activity is done well. Thus the cultivable area by types of crops is not always stable.

Further, the cultivable areas in the valley are mainly used for cereals particularly rice. During the period of our analysis i.e. from 2000-01 to 2010-11, 75 to 80% of the cultivable lands are used for cereals i.e. rice and maize. Still maize constitutes a little proportion of the total cereals cultivated. Since rice being the staple food of both valley and hill people in Manipur, paddy is mainly grown in all the valley areas of Manipur. In the course of our analysis it was only in 2009-10 the percentage share of cereals sharply fell to 52.34%, whereas that of pulses and oilseeds constituted about 42% of the total cultivable areas. The sudden increase in the percentage shares of the two crops during the particular year was mainly due to the occurrence of natural catastrophe.
During this year due to non-availability of adequate water supply paddy fields were mainly used for growing pulses and oilseeds. From time immemorial the valley dwellers used the cultivable areas mainly for growing rice; vegetable and pulses are grown in the form of kitchen gardens in limited areas. Therefore, in the past decades most of the paddy fields in the valley areas remain unused at least for 4/5 months in a year. It was only with the introduction of green revolution, double cropping system was introduced and some paddy fields were also used for growing cash crops. It is also revealed that most of the farmers in the valley areas would like to grow cereals and little importance has been given to cash crops.

We also made an intensive study about the cropping pattern in various valley districts as shown in Table no.4.2. From the table it is seen that the relative importance given to cereals and cash crops differ from district to district. In Imphal East District more than 85% of the farmers would like to grow cereals, the figure was as high as 90% in 2000-01. Though there was a declining tendency during last ten years, more than 80% of the cultivated areas are still used for growing cereals except in the 2009-10 where only 49% of
TABLE NO.4.2.
CROPPING PATTERN OF DISTRICTWISE IN MANIPUR ('000 HECTARES)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imphal East</th>
<th></th>
<th>Imphal West</th>
<th></th>
<th>Thoubal</th>
<th></th>
<th>Bishnupur</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cereals</td>
<td>Cash Crops</td>
<td>Cereals</td>
<td>Cash Crops</td>
<td>Cereals</td>
<td>Cash Crops</td>
<td>Cereals</td>
<td>Cash Crops</td>
</tr>
<tr>
<td>2000-01</td>
<td>31.99 (90%)</td>
<td>4.04 (10%)</td>
<td>35.11 (89%)</td>
<td>3.87 (11%)</td>
<td>27.36 (71%)</td>
<td>10.64 (29%)</td>
<td>27.74 (73%)</td>
<td>10.12 (27%)</td>
</tr>
<tr>
<td>2001-02</td>
<td>30.26 (86%)</td>
<td>5.01 (14%)</td>
<td>33.72 (88%)</td>
<td>4.68 (12%)</td>
<td>26.22 (77%)</td>
<td>7.88 (23%)</td>
<td>27.92 (74%)</td>
<td>9.64 (26%)</td>
</tr>
<tr>
<td>2002-03</td>
<td>22.92 (86%)</td>
<td>3.6 (14%)</td>
<td>24.34 (87%)</td>
<td>3.64 (13%)</td>
<td>12.63 (55%)</td>
<td>10.37 (45%)</td>
<td>21.8 (69%)</td>
<td>9.97 (31%)</td>
</tr>
<tr>
<td>2003-04</td>
<td>31.51 (84%)</td>
<td>6.04 (16%)</td>
<td>33.92 (85%)</td>
<td>6.12 (15%)</td>
<td>25.99 (72%)</td>
<td>9.92 (28%)</td>
<td>27.32 (70%)</td>
<td>11.71 (30%)</td>
</tr>
<tr>
<td>2004-05</td>
<td>31.38 (84%)</td>
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<td>33.81 (85%)</td>
<td>5.83 (15%)</td>
<td>25.85 (73%)</td>
<td>9.47 (27%)</td>
<td>27.07 (69%)</td>
<td>11.97 (31%)</td>
</tr>
<tr>
<td>2005-06</td>
<td>31.28 (82%)</td>
<td>6.65 (18%)</td>
<td>31.97 (83%)</td>
<td>6.71 (17%)</td>
<td>23.94 (70%)</td>
<td>10.3 (30%)</td>
<td>25.56 (67%)</td>
<td>12.79 (33%)</td>
</tr>
<tr>
<td>2006-07</td>
<td>31.43 (82%)</td>
<td>7.11 (18%)</td>
<td>33.5 (83%)</td>
<td>7.08 (17%)</td>
<td>27.38 (72%)</td>
<td>10.73 (28%)</td>
<td>27.1 (67%)</td>
<td>13.31 (33%)</td>
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<tr>
<td>2007-08</td>
<td>33.13 (81%)</td>
<td>7.63 (19%)</td>
<td>35 (82%)</td>
<td>7.56 (18%)</td>
<td>28.65 (73%)</td>
<td>10.83 (27%)</td>
<td>25.06 (64%)</td>
<td>14.14 (36%)</td>
</tr>
<tr>
<td>2008-09</td>
<td>34.37 (81%)</td>
<td>8 (19%)</td>
<td>34.68 (81%)</td>
<td>7.89 (19%)</td>
<td>28.93 (71%)</td>
<td>11.61 (29%)</td>
<td>28.86 (66%)</td>
<td>15.08 (34%)</td>
</tr>
<tr>
<td>2009-10</td>
<td>15.79 (49%)</td>
<td>16.76 (51%)</td>
<td>26.43 (62%)</td>
<td>16.35 (38%)</td>
<td>21.86 (51%)</td>
<td>20.76 (49%)</td>
<td>20.18 (47%)</td>
<td>22.85 (53%)</td>
</tr>
<tr>
<td>2010-11</td>
<td>34.49 (81%)</td>
<td>8.23 (19%)</td>
<td>36.9 (82%)</td>
<td>8.19 (18%)</td>
<td>30.42 (72%)</td>
<td>11.74 (28%)</td>
<td>27.99 (66%)</td>
<td>14.72 (34%)</td>
</tr>
</tbody>
</table>

*In the valley areas cereals we mean rice and maize only being the major crops. Cash crops consist of pulses, oil seeds, sugar cane and potato.

** Note: Figures in the parantheses show the % share.

Source: Department of Agriculture, Government of Manipur
the total cultivated area was used for growing cereals and 51% being used for growing cash crops. This abnormal situation may be happened in this particular year in all valley districts of Manipur due to the occurrence of some natural catastrophe. In the next year when the normal situation comes the farmers used to grow the traditional cereal crops.

Similarly in Imphal west also, more than 85% (on average) of the farmers used to cultivate cereals and only about 15% of the cultivated areas are used for growing cash crops like pulses, oilseeds, sugarcane and potato etc. On the contrary, the two valley districts of Manipur namely Thoubal and Bishnupur seem to give more importance in cultivating cash crops than Imphal East and Imphal West.

In Thoubal district nearly 30% of the cultivable areas are used for cash crops. Likewise, the importance of cash crops has been increasing during the last decade or so in Bishnupur district also. More than 30% of the cultivable lands are now used for growing cash crops. The percentage share of land use for growing cash crops increased from 27% in 2000-01 to 36% in 2007-08 and remained more or less the same around 34% in 2010-11.
This all means that in recent years the habits of the farmers to grow the traditional items of cereals, mainly rice, has been changed significantly. Cash crops now being considered as best alternative means of earning higher income.

In recent years the farmers instead of cultivating local indigenous variety of rice like Moirangthem, Phoudum, Taothabi etc. now most of the cultivators would like to grow HYV seeds and also profitable cash crops like sugarcane, pulses and oilseeds. In fact this is a good symptom of improving the economic condition of the poor peasants. The habit of cultivating vegetables as kitchen garden items also becoming loses and a momentum to grow such items with a profit earning motive seems to be gained in recent year.

**Cropping Intensity in Valley Districts of Manipur**

The intensity of cropping pattern implies the degree of cropping on the number of crops grown in the same plot during one agricultural year. Area having high index of intensity reveal the dominance of productive soil, developed irrigation facilities and developed agricultural practices. On the other hand, areas securing
low index of intensity are producing less crops either due to unsuitable land, water logging, and non-agricultural use of land and less developed irrigation.

In order to raise the agricultural productivity and also to formulate a concrete agricultural policy so as to achieve the goal of self reliance in all economic activities- particularly in agricultural sector, an-in-depth analysis of the cropping intensity is also of equal importance.

In doing so, we prepare a table showing a net area sown, area sown more than once, gross area under crops and cropping intensity indices of both valley areas and state as a whole. This is shown in Table no.4.3. It is revealed that the net area sown during the period from 2000-01 to 2010-11, the net area sown though somewhat erratic increases from 107.24 thousand hectares to 120.63 thousand hectares.
### TABLE NO.4.3.

**CROPPING INTENSITY IN THE VALLEY AREAS OF MANIPUR ('000 hectares)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Area sown</th>
<th>Area sown more than once</th>
<th>Gross area under crops</th>
<th>Intensity index</th>
<th>Total state</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>107.24</td>
<td>38.69</td>
<td>145.93</td>
<td>136.08</td>
<td>121.61</td>
</tr>
<tr>
<td>2001-02</td>
<td>107.37</td>
<td>33.79</td>
<td>141.16</td>
<td>131.47</td>
<td>119.43</td>
</tr>
<tr>
<td>2002-03</td>
<td>75.88</td>
<td>30.11</td>
<td>105.99</td>
<td>139.68</td>
<td>121.31</td>
</tr>
<tr>
<td>2003-04</td>
<td>109.73</td>
<td>39.55</td>
<td>149.28</td>
<td>136.04</td>
<td>121.72</td>
</tr>
<tr>
<td>2004-05</td>
<td>110.30</td>
<td>37.83</td>
<td>148.13</td>
<td>134.30</td>
<td>121.58</td>
</tr>
<tr>
<td>2005-06</td>
<td>111.48</td>
<td>37.72</td>
<td>149.20</td>
<td>133.84</td>
<td>127.13</td>
</tr>
<tr>
<td>2006-07</td>
<td>113.15</td>
<td>44.39</td>
<td>157.54</td>
<td>139.23</td>
<td>130.76</td>
</tr>
<tr>
<td>2007-08</td>
<td>118.73</td>
<td>47.59</td>
<td>166.32</td>
<td>140.08</td>
<td>133.40</td>
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<tr>
<td>2008-09</td>
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<td>49.39</td>
<td>168.70</td>
<td>141.40</td>
<td>134.88</td>
</tr>
<tr>
<td>2009-10</td>
<td>71.76</td>
<td>88.41</td>
<td>160.17</td>
<td>223.20</td>
<td>214.95</td>
</tr>
<tr>
<td>2010-11</td>
<td>120.63</td>
<td>52.05</td>
<td>172.68</td>
<td>143.15</td>
<td>137.32</td>
</tr>
</tbody>
</table>

*Source: Department of Agriculture, Government of Manipur*
Area sown more than once also increased from 38.69 thousand hectares in 2000-01 to 52.05 thousand hectares in 2010-11. The intensity index also shows an increasing tendency by raising from 136.08 in 2000-01 to 143.15 in 2010 as against the state figure of 121.612 and 137.32 respectively during the same period.

We also make an-in-depth study of District-wise cropping intensity in the valley areas of Manipur in Table no.4.4. As seen from the table the trend of gross area sown in the Imphal East District of Manipur though somewhat erratic has an increasing tendency. The gross area sown in 2000-01 was 35.58 thousand hectares fell to 26.09 thousand hectares in 2002-03, but rose to 37.01 thousand in 2003-04 and further to 42.37 thousand in 2008-09. However, it fell to 32.55 thousand in 2009-10 but again rose to 42.72 thousand in 2010-11. Along with the increase in gross sown area, the net sown area though erratic increases from 3.42 thousand hectares in 2000-01 to 5.2 thousand in 2005-06, further to 6.84 thousand in 2008-09. The year 2009-10 was an exception; there was manifold increase in net sown area to the highest peak of 18.91 thousand. This exceptional increase in net sown area was due multiple cropping in the cash crops rather than to grow cereals due
TABLE NO.4.4.

DISTRICTWISE CROPPING INTENSITY IN MANIPUR ('000 hectares)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imphal East</th>
<th></th>
<th></th>
<th></th>
<th>Imphal West</th>
<th></th>
<th></th>
<th></th>
<th>Thoubal</th>
<th></th>
<th></th>
<th></th>
<th>Bishnupur</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Net sown Area</td>
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<td>Gross Area</td>
<td>Cropping Intensity</td>
<td>Net sown Area</td>
<td>Sown More than once</td>
<td>Gross Area</td>
<td>Cropping Intensity</td>
<td>Net sown Area</td>
<td>Sown More than once</td>
<td>Gross Area</td>
<td>Cropping Intensity</td>
<td>Net sown Area</td>
<td>Sown More than once</td>
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<td>11.77</td>
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<td>30.51</td>
<td>4.21</td>
<td>34.72</td>
<td>113.80</td>
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<td>9.28</td>
<td>37.77</td>
<td>132.57</td>
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<td>25.72</td>
<td>10.4</td>
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<td>21.16</td>
<td>6.41</td>
<td>27.57</td>
<td>130.29</td>
<td>10.41</td>
<td>10.85</td>
<td>21.26</td>
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<td>37.01</td>
<td>116.35</td>
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<td>10.31</td>
<td>39.60</td>
<td>135.20</td>
<td>23.02</td>
<td>11.36</td>
<td>34.38</td>
<td>149.35</td>
<td>25.61</td>
<td>12.68</td>
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<td>9.78</td>
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<td>25.81</td>
<td>12.53</td>
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<tr>
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<td>37.93</td>
<td>116.71</td>
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<td>8.88</td>
<td>38.68</td>
<td>129.80</td>
<td>23.27</td>
<td>10.97</td>
<td>34.24</td>
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<td>148.01</td>
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<td>10.16</td>
<td>40.58</td>
<td>133.40</td>
<td>23.78</td>
<td>14.23</td>
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<td>14.23</td>
<td>40.41</td>
<td>154.35</td>
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<td>2007-08</td>
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<td>40.76</td>
<td>118.28</td>
<td>31.64</td>
<td>10.92</td>
<td>42.56</td>
<td>134.51</td>
<td>24.72</td>
<td>15.16</td>
<td>39.88</td>
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<td>27.91</td>
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<td>154.50</td>
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<td>2008-09</td>
<td>35.53</td>
<td>6.84</td>
<td>42.37</td>
<td>119.25</td>
<td>31.24</td>
<td>11.33</td>
<td>42.57</td>
<td>136.27</td>
<td>24.96</td>
<td>15.58</td>
<td>40.54</td>
<td>162.42</td>
<td>27.58</td>
<td>15.64</td>
<td>43.22</td>
<td>156.71</td>
</tr>
<tr>
<td>2009-10</td>
<td>13.64</td>
<td>18.91</td>
<td>32.55</td>
<td>238.64</td>
<td>22.75</td>
<td>20.03</td>
<td>42.78</td>
<td>188.04</td>
<td>18.80</td>
<td>23.0</td>
<td>41.80</td>
<td>222.39</td>
<td>16.57</td>
<td>26.46</td>
<td>43.03</td>
<td>259.69</td>
</tr>
<tr>
<td>2010-11</td>
<td>35.37</td>
<td>7.35</td>
<td>42.72</td>
<td>120.78</td>
<td>32.26</td>
<td>12.83</td>
<td>45.09</td>
<td>139.77</td>
<td>26.01</td>
<td>16.15</td>
<td>42.16</td>
<td>162.09</td>
<td>25.90</td>
<td>21.81</td>
<td>47.71</td>
<td>164.90</td>
</tr>
</tbody>
</table>

Source: Department of Agriculture, Government of Manipur
to natural catastrophe i.e. happening of droughts in this year. This is a good symbol of opening a pathway to the introduction of green revolution in the state. The index of cropping intensity also increases steadily from 110.63 in 2000-01 to 120.78 in 2010-11.

Here it is to be mentioned that the degree of urbanization increases much faster in Imphal East and West Districts of Manipur than the two other valley Districts of Manipur viz. Thoubal and Bishnupur. A sizable area of the cultivable land has already been converted into homestead lands, brick fields, ponds for fish farming and other commercial purposes. The increase in gross sown area of the two districts in recent years, despite the conversion of cultivable lands into uncultivable one, was mainly due to increase in area sown more than once as well as net sown area. In fact, when economic development takes place urbanization automatically pace ahead thereby causing a change in land use pattern.

The cropping intensity indices for both Thoubal and Bishnupur Districts of Manipur are comparatively higher than that of Imphal East & West districts of Manipur. The net sown areas in
both the districts are comparatively lower than that of Imphal East and West districts. Whereas, the area sown more than once are higher than that of Imphal East and West Districts. For example, the gross area sown in Bisnupur Districts increases steadily from 36.78 thousand hectares in 2000-01 to 47.71 thousand hectares in 2010-11 except in the year 2002-03. Similarly, in Thoubal District the gross area sown increases from 34.24 to 42.16 thousand hectares during 2005-06 and 2010-11, though the movement was somewhat erratic during 2000-01 to 2004-05. It all means that the cropping intensity in the two districts of Manipur than that of Imphal East and West Districts and also other hill districts of Manipur. In other words, the wave of urbanization particularly that of industrialization hardly affects the agricultural activities in these two districts of Manipur.

From the above analysis, it is also known that the ratio of area sown more than once to the gross area sown in all the valley districts of Manipur is too low. For example, in the case of Imphal East the average gross area sown during 2000-01 to 2010-11 works out to be 405.88 thousand hectares. Whereas, the average area sown more than once in the same districts during the same period is
71.09 thousand hectares constituting only 17% indicating that 83% of the gross cultivable area still lying unutilized. Similarly in Imphal West also only 27% of the gross area sown during the same period was used for more than once and the remaining 73% still remain unutilized for at least 6/7 months in a year. Likewise in Thoubal district also only 38% of the gross sown area are used for more than once and 62% of the cultivable areas are used once in a year. In the case of Bishnupur, the net area sown more than once constituted only 34% and 56% of the gross sown area are not used more than once. Though the area sown more than once is comparatively high in the two districts of Manipur namely Thoubal and Bishnupur than that of Imphal East and West the overall percentage net sown area in all valley districts of Manipur works out to be 29% during the period of analysis. In short, 71% of the gross sown areas in the valley districts of Manipur are lying idle at least for 5 to 6 months every year. There is every possibility of raising agricultural productivity in the state by raising cropping intensity particularly in the valley districts of Manipur.
Reasons for low cropping intensity

There are many important factors for low cropping intensity in the state of which we laid down the following most important factors discuss in details.

1. Heavy dependence on Monsoon:

   Being one of the most backward state in the country the agricultural activities in the state depends almost entirely upon monsoon, since the irrigation facilities provided so far is quite limited. Out of the 161.39 thousand hectares of gross area under rice and maize only 38.31 thousand hectares were irrigated in the whole state in the year 1999-2000. In the same year out of the 89.3 thousand hectares under Rice and Maize only 24 thousand hectares were under irrigation. The total area irrigated in 2010-11 decreased to 36.98 thousand hectares when the total cultivated area increase to 173.79 thousand hectares. Thus net irrigated area instead of increase had a declining tendency. In such situation the cropping intensity cannot be raised. Most of the major and medium irrigation projects undertaken by the government still remain incomplete and cannot provide irrigation facilities. Thus the
practices of double cropping or multiple cropping still remain unsuccessful in the state.

2. Low consumption of fertilizer:

Another important factor which leads to the failureness of new agricultural strategy is very low level utilization of fertilizers and chemicals in the state. The consumption of fertilizers and chemicals in the hill areas is almost negligible. Though the consumption of fertilizers and chemicals is comparatively higher in the valley districts than hill districts, the most pathetic tendency in the state is that there has been a declining tendency in the use of fertilizers and chemicals during the last decades or so. The total consumption of fertilizers in the state in 2002-03 was 56.7 thousand tones. It continuously reduced to 13.88 thousand tones in 2010-11. The consumption of fertilizers in 2008-09 was 80 kg. Per hectare as against all India average consumption of 128.06 kgs per hectare. In 2010-11 the consumption of fertilizers in the state steeply felt to 43 kg. Per hectare as against the all India average of 144.1 kg. per hectare. The most confusing state in our mind is that the consumption of fertilizers increases almost one and half times during the period 2000-01 to 2010-11 that is from 16,700 thousand
tones to 31,220 thousand tones whereas the consumption of fertilizers in the state decreased from 56.7 thousand tones to 13.88 thousand tones in 2010-11. The reason for such drastic reduction in the consumption of fertilizers is unknown to us. In such situation, it will be almost impossible to raise the cropping intensity in the state.

3. Present Land Tenure System:

It is already mentioned most of the cultivable lands are not owned by the peasants or cultivators themselves. The real owners of land used to live in the urban areas and they lend their lands to the peasants on rent that is also to be paid in kind i.e. Paddy. The peasants used land to grow Paddy once in a year and rent is also paid once in land owner. The traditional way of using these cultivable lands is that all the necessary expenditures for ploughing, procurement of seeds, fertilizers, pesticides, hiring of labour to grow the paddy saplings and harvesting are incurred by the peasants from their own sources. The owners of land do not contribute anything towards these expenditures. At the time of harvesting, the peasants used to pay about 1/5 of the total production (conventionally 16 phou pot of paddy per pari).
Since the peasants are too poor, because the residue production of paddy after the payment of rent being only their annual income, they do not have any means as well as incentives to grow another crop during the lean season. This leads to low cropping intensity in the state. During these days of lean season the peasants instead of confining to the paddy fields; they used to engage themselves in other activities like fishing, handicraft works, and manual labour.

4. Lack of Mechanization:

Agricultural mechanization has made significant contribution in enhancing cropping intensity. The growth in irrigated areas and tractor density has had direct bearing on the cropping intensity. Findings of the studies conducted in the past are briefly presented to highlight the contribution of mechanization in enhancing the cropping intensity.

Chopra (1974) carried out a study on a sample of Punjab farms. He made a comparison of tractor-owning farms in terms of the situation before and after the introduction of tractors. The cropping intensity was reported to be higher after the introduction of tractors.
NCAER (1974) conducted a study of tractorised and non-tractorised farms in nine states of India. The study revealed that tractor-owning farms had a higher cropping intensity of 137.5 percent as compared to 131.8 percent in the case of those without a tractor.

From table no.4.5 it is seen that the total number of tractors and power tillers used in 2003 was only 2429 in order to cultivate 149.28 thousand hectares in the valley areas of Manipur. In terms of percentage it is only 1.63% i.e. 98.37% of the total cultivated area used the conventional methods of animal operated implement like wooden plough, steel plough, disc harrow, seed cum fertilizer drill, leveller, animal cart etc. Because of this heavy dependence on animal operated implements and lack of use of modern machines and tools lead to low cropping intensity in the state.

Though mechanization is helpful in raising the level of cropping intensity by introducing double or multiple cropping systems, it cannot be extensively used/ introduced in Manipur because of fragmented and small size of holding. The agricultural holding/land holding is the amount of land by a farmer. In
TABLE NO.4.5.

*Agricultural Machinery and Implements in Manipur*  
*(in numbers)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Animal operated implements</th>
<th>Tractor &amp; other power operated implements</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hills</td>
<td>Valley</td>
<td>Sub Total</td>
</tr>
<tr>
<td>1997</td>
<td>24,499 (20.5)</td>
<td>94860 (79.5)</td>
<td>119359 (100)</td>
</tr>
<tr>
<td>2003</td>
<td>26909 (24.9)</td>
<td>81231 (75.1)</td>
<td>108140 (100)</td>
</tr>
</tbody>
</table>

Manipur, arable land is limited and majority of farming community have small and marginal land holdings which make them difficult to practice any subsistence farming.

5. Size of Holding:

The area of operational holding is about 172 thousand hectares operated by 150.4 thousand farmers as per the agricultural census 2005-06. The area operated in small and marginal holdings accounted for 59.77% in 2005-06. The average size of operational holdings for Manipur was 1.14 hectares in 2005-06. This is shown in table no. 4.6.

6. Lack of Funding agencies in agriculture sector:

Another problem of agriculture in Manipur which leads to low cropping intensity in the state is unorganized/absence of financial institutions. This has already been discussed in chapter-III. The banking network to finance agricultural sector is still too narrow. The main source of agricultural financing money lenders and Mahajans which are exorbitant rate of interest is thereby extracted major parts of the hard earned to money by the poor farmers. This also leads to inability to practice double and multiple cropping systems among the poor farmers.
### TABLE NO. 4.6

**Distribution of operational holdings in respect of Manipur State**

<table>
<thead>
<tr>
<th>Size of holding</th>
<th>Category Of farmer</th>
<th>No. of operational Holding ('000)</th>
<th>Area operated ('000 Hect.)</th>
<th>Average size of Operational holding (Hect.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1.0</td>
<td>Marginal</td>
<td>69.00 75.00 76.5</td>
<td>39.00 40.00 40.00</td>
<td>0.57 0.53 0.52</td>
</tr>
<tr>
<td>1.0-2.0</td>
<td>Small</td>
<td>49.00 49.00 48.8</td>
<td>67.00 63.00 62.8</td>
<td>1.37 1.29 1.29</td>
</tr>
<tr>
<td>2.0-4.0</td>
<td>Semi-medium</td>
<td>21.00 22.00 22.3</td>
<td>54.00 55.00 55.3</td>
<td>2.57 2.47 2.48</td>
</tr>
<tr>
<td>4.0-10.0</td>
<td>Medium</td>
<td>3.00 3.00 2.8</td>
<td>14.00 14.00 13.5</td>
<td>4.67 4.86 4.86</td>
</tr>
<tr>
<td>10.0 &amp; above</td>
<td>Large</td>
<td>Neg. Neg. -</td>
<td>Neg. Neg. 0.4</td>
<td>- 11.38 11.13</td>
</tr>
<tr>
<td>All holdings</td>
<td></td>
<td>142.00 149.00 150.4</td>
<td>174.00 172.00 172.00</td>
<td>1.22 1.15 1.14</td>
</tr>
</tbody>
</table>

Neg. – Negligible


*Ministry of Agriculture Government of India.*

7. Lack of massive use of HYVs+IVs seeds:

From time immoral the farmers in the state used to grow indigenous varieties of seeds which are yielding not so high productivity but they had peculiar taste and quality of rice. However, in recent years due to rapid growth of population i.e. heavy pressure on land and the indigenous products could not meet the growing demand for food. This has already been discussed in details in the previous chapter that though HYVs+IVs seeds are introduced and used at the increasing rate nearly 50% of the cultivated land in the state still used indigenous type of seeds and as such the cropping intensity cannot enhance because these indigenous seeds/varieties of rice take more time to grow and ripe.

Main Findings:

The main findings of the present chapter can be summed up as follows:

1. Cereals like rice and maize are the major crops grown in the valley districts of Manipur. Rice is the main cereal crop grown in all valley areas. Maize constitutes a little proportion of the total cereals cultivated.
2. Cash Crops are grown in a limited way. Not only they constitute a small proportion of the total crops grown, the relative share of cash crops differs from district to district.

3. In Imphal East and West Districts of Manipur cash crops like pulses, oilseeds, sugarcane, potato etc. constitute only 15% of the total cultivated areas. On the other hand, the two valley districts of Manipur like Thoubal and Bishnupur give more emphasis on cash crops. About 30% of the total cultivable lands are now used for growing commercial/cash crops. In these two districts the importance of cash crops has been increasing in recent years.

4. From time immemorial monocrop system has been practicing since most of the cultivable lands do not have irrigation facilities. Most of the paddy fields are still lying idle after the first paddy crops till next monsoon comes.

5. Vegetables pulses are grown mostly in the form of kitchen gardens since irrigation facilities are available in limited way, which makes double and multiple cropping impossible.

6. Last but not the least it can be concluded that there has been marked changes in the pattern of land utilization in the state. Most of the farmers have been trying to implement the new
techniques of agricultural development by using HYV seeds, fertilizers, tractors, pesticides etc. in recent years but still the effort is less successful.

So far we have examined the effect of change in the cropping pattern and cropping intensity on the agricultural development in the state. It will also of immense importance to examine the importance of land reform measure taken by the state in recent years and its impact on the introduction of new agricultural strategy in the state. The analysis of land reform measures will constitute an important issue since there is peculiar land tenure system unlike in other states.