Chapter VI

DEVELOPMENT OF NATURAL RESOURCES:
AGRARIAN MODE OF PRODUCTION

The agrarian mode of production in the Chenab Basin may be recognized as consisting of two main types:

(i) High altitude agriculture which can easily be described as crop husbandry; and

(ii) Sedantary agriculture of the lower slopes and valley bottoms.

This typological classification is based primarily on the viability of agriculture as an economic activity which is dependent on environmental factors, such as altitude and climate.

Many people are simple farmers who grow certain crops for their sustenance. This is a stage at a higher economic level than food gathering. This type of activity is prevalent in higher altitude areas of Bhutna valley just above 2,439 metres (9,000 feet), upper valley of Maru-Warwan, Pogal-Paristan, upper Desa and all the areas lying above 8,000 feet in Neeru and Kalnai valleys.

These people are settled but their cropping practices are very primitive only because of unfavour-

able climatic conditions, difficult and rugged terrain and poor accessibility.

In general, the farm of cultivation is food-crop based. In these higher reaches of the Chenab Basin the main crops are maize, grim and trumba. Animals play a minor role in the economy. In general two sub-types of primitive cultivation that can be distinguished are:

(i) Semi-shifting type; and
(ii) Sedentary type.

(i) **Semi-Shifting Type**

People who are engaged in the form of cultivation have fixed dwellings but they change their fields bringing into cultivation the forest land after unlawful cutting the trees and again abandoning them after three or four years. Only a handful of people practise this type of cultivation. This type of activity can be observed in Machail village in Bhutna valley, Batyas village in Paddar, Parittan in Ramban and in a number of villages in Bhalesa and Marwah regions.

(ii) **Sedentary type**

In this type of cultivation the farmer neither shifts his field nor his dwellings. The farmers are capable of rating the soil. Their knowledge index is a

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little better to qualify which crops can be grown where, although the yield is very low due to poor resources of intensification of cultivation. This type of activity is practised all over the region with varying degree of intensity.

It, however, varies from backward methods of cultivation to skilled and highly intensive tillage. The degree of intensification of cultivation is controlled by the climate and physiography of the region. At higher altitudes 100 per cent area is under maize or trumba or grim and as one moves towards the valley bottoms the proportion of irrigated area goes on increasing and land utilization goes on becoming more and more varied. Out of 648 inhabited villages 26 villages have 100 per cent of its work force engaged in cultivation. These villages are situated on the mountain slopes such as Pari Jagir and Lengara in Ramban tehsil; Bhatri, Chakri and Hamirpur in Doda tehsil; Budhi, Mahri, Chuteri, Kundi, Sahan, Shakla and Sharni in Bhaderwah tehsil and Muthal, Chingnana, Keshwar, Bhandara and Bershala in Kishtwar tehsil. The incidence is on food crops, especially on maize cropping.

3. Ibid., p. 68.

4. The researcher came across these interesting patterns of crop-culture in these villages in the course of field-work.
### TABLE VI-A

**Physiological Density**

<table>
<thead>
<tr>
<th>No. of rural inhabitants/ hectare of cultivated area</th>
<th>No. of villages</th>
<th>% villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1</td>
<td>3</td>
<td>0.46</td>
</tr>
<tr>
<td>1 - 2</td>
<td>18</td>
<td>2.77</td>
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<td>2 - 3</td>
<td>58</td>
<td>8.95</td>
</tr>
<tr>
<td>3 - 4</td>
<td>131</td>
<td>20.20</td>
</tr>
<tr>
<td>4 - 5</td>
<td>148</td>
<td>22.8</td>
</tr>
<tr>
<td>5 - 6</td>
<td>121</td>
<td>18.67</td>
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<td>6 - 7</td>
<td>64</td>
<td>9.87</td>
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<td>7 - 8</td>
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<td>8 - 9</td>
<td>28</td>
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<tr>
<td>9 - 10</td>
<td>17</td>
<td>2.6</td>
</tr>
<tr>
<td>10+</td>
<td>18</td>
<td>2.77</td>
</tr>
</tbody>
</table>

#### Altitude and physiological density

<table>
<thead>
<tr>
<th>Rural Population Area</th>
<th>Net Cultivated Area</th>
<th>Physiological density</th>
<th>% Population</th>
<th>Cum. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>4000</td>
<td>13552</td>
<td>3101</td>
<td>4.37</td>
<td>4.2</td>
</tr>
<tr>
<td>4-5000</td>
<td>64859</td>
<td>17892</td>
<td>3.62</td>
<td>20.1</td>
</tr>
<tr>
<td>5-6000</td>
<td>122619</td>
<td>23699</td>
<td>5.17</td>
<td>38.0</td>
</tr>
<tr>
<td>6-7000</td>
<td>76476</td>
<td>15958</td>
<td>5.78</td>
<td>23.7</td>
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<tr>
<td>7-8000</td>
<td>48103</td>
<td>9432</td>
<td>5.10</td>
<td>10.00</td>
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<tr>
<td>8-9000</td>
<td>12907</td>
<td>681</td>
<td>18.95</td>
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<tr>
<td>+ 9000</td>
<td>575</td>
<td>208</td>
<td>2.76</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Total** 322684 59971.88 5.38
VI.1 SEDANTARY AGRICULTURE:

A sedentary form of agriculture is mainly confined to the valley basins. In this type of agrarian economy prime importance is given to crops. Among the crops foodgrains are given priority and among the foodgrains maize emerges as a dominant crop of the region as it is sown in more than 60 per cent of the gross cropped area. The predominance of maize is mainly due to topography and climate. Wheat, paddy are among the other food crops.

VI.1.1 Pressure on Land:

Pressure on cultivated land is quite high as the physiological density of the region as a whole accounts for 5.30 rural inhabitants per hectare of net cultivated area. In other words average net sown area per person is 0.4 hectares. Ramban and Bhaderwah tehsils have higher physiological density accounting for 6.6 and 5.7 persons per hectare respectively. Doda tehsil has the lowest physiological density, i.e., 4.60 persons per hectare.

There are 648 villages in the Chenab basin. In three villages physiological density is less than 3

5. Physiological density is a ratio between rural population and net cultivated area.
rural inhabitants per hectare of cultivated area. In 18 villages this ratio ranges between 1 to 2 rural inha-
bitant per hectare of cultivated area (Table VI.1). The number of villages increases to 57 in the next higher category of physiological density. The proportion of rural population to cultivated land per hectare ranges between 4 to 5 in 141 villages. Above this category the number of villages goes on decreasing. The highest ratio, i.e., more than 61 per cent of the villages the physiological density ranges between 3 and 6 persons.

VI.1.2 Land Use Pattern:

Exploitation of land, virgin or already under use, has been the most important economic activity in the region which is reflected in the large work force engaged in agriculture accounting for a little more than 75 per cent. Inspite of the fact that cultivable land is limited (5.2 per cent of the geographical area) agriculture employs about 77 per cent of the total workforce of the region, including agricultural labourers. This is because the other modes of economy are not developed and have little to offer.

The physico-climatic conditions in the region are such that 65 per cent of the total area of the region remains unutilized. Out of 11,691 square kilometres
only 4,131 square kilometres have been recorded in the village paper records of the revenue department.

According to the revenue records the village paper area of the region adds up to 4,11,568.41 hectares (10,16,574 acres) on 15 November 1978. 6 Kishtwar tehsil has the highest share with 39.9 per cent of the total followed by Ramban and Doda tehsils accounting for 27.3 and 25.77 per cent respectively, whereas the share of Bhaderwah tehsil is as low as 7.9 per cent. The bulk of the village paper area is occupied by the forests accounting for 53.41 per cent and about 13.18 per cent of the village area is either barren or put to non-agricultural uses. Permanent pastures account for 11.44 per cent of this area and 5.81 per cent area is described as cultivable waste. Fallow lands, current and other than current, account for 2.19 per cent of the village paper area and the remaining 14 per cent area is under cultivation. A little more than 26 per cent of the net sown area is cultivated twice.

VI.1.3 General Patterns at Tehsil Level:

At tehsil level, wide variations have been noticed in the pattern of land utilisation. Bhaderwah teh-

TABLE V. 1

<table>
<thead>
<tr>
<th>Land Use Categories</th>
<th>KISHTWAR TEHSIL</th>
<th>BHADERWAH TEHSIL</th>
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</thead>
<tbody>
<tr>
<td>1. Village Paper Area</td>
<td>406102</td>
<td>406149</td>
</tr>
<tr>
<td>2. Forest Area</td>
<td>66.2</td>
<td>60.2</td>
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<tr>
<td>3. Culturable Waste</td>
<td>7.0</td>
<td>6.9</td>
</tr>
<tr>
<td>4. Area not available for cultivation</td>
<td>12.4</td>
<td>12.9</td>
</tr>
<tr>
<td>5. Pastur Lands</td>
<td>1.0</td>
<td>0.06</td>
</tr>
<tr>
<td>6. Fallow lands other than cult.</td>
<td>0.2</td>
<td>7.00</td>
</tr>
<tr>
<td>7. Current Fallow</td>
<td>0.3</td>
<td>0.25</td>
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<tr>
<td>8. Orchards</td>
<td>1.5</td>
<td>2.00</td>
</tr>
<tr>
<td>9. Net Sown Area</td>
<td>9.4</td>
<td>10.00</td>
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<table>
<thead>
<tr>
<th>DODA TEHSIL</th>
<th>RAMBAN TEHSIL</th>
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<tr>
<td>1. Village Paper Area</td>
<td>252949</td>
</tr>
<tr>
<td>2. Forest Area</td>
<td>50.2</td>
</tr>
</tbody>
</table>

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Table VI.2 cont...

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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Culturable Waste</td>
<td>3.0</td>
<td>5.3</td>
<td>3.0</td>
<td>3.0</td>
<td>8.7</td>
<td>8.7</td>
<td>9.4</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>4. Area not available for cultivation</td>
<td>18.9</td>
<td>18.3</td>
<td>16.1</td>
<td>9.07</td>
<td>13.3</td>
<td>12.5</td>
<td>14.5</td>
<td>15.4</td>
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<tr>
<td>5. Pastures land</td>
<td>1.7</td>
<td>1.2</td>
<td>0.2</td>
<td>1.7</td>
<td>6.6</td>
<td>6.0</td>
<td>0.2</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>6. Fallow lands other than cult.</td>
<td>0.4</td>
<td>1.0</td>
<td>3.1</td>
<td>0.4</td>
<td>4.2</td>
<td>3.0</td>
<td>2.94</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>7. Current Fallow</td>
<td>3.8</td>
<td>1.0</td>
<td>0.23</td>
<td>2.6</td>
<td>1.6</td>
<td>2.0</td>
<td>0.3</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>8. Orchards</td>
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<td>9.1</td>
<td>10.0</td>
<td>12.74</td>
<td>0.00</td>
<td>2.0</td>
<td>NA</td>
<td>6.58</td>
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<tr>
<td>9. Net Sown Area</td>
<td>11.5</td>
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<td>15.14</td>
<td>15.65</td>
<td>10.7</td>
<td>12.6</td>
<td>12.34</td>
<td>12.85</td>
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</table>

**Source:** Statistical Handbooks, Directorate of Statistics, Srinagar
Himalayan Chenab Basin in Jammu & Kashmir

AREA UNDER FOREST
PERCENTAGE TO TOTAL VILLAGE PAPER AREA
1978-79

Fig 61
sil which accounts for 7.9 per cent of the total village paper area of the region has the highest proportion of its area under cultivation, whereas the Kishtwar tehsil which accounts for maximum village area of the region has the lowest proportion of its area under cultivation. A little more than 38 per cent of the village paper area in Bhaderwah tehsil is under cultivation followed by Doda with 13.4 per cent, Ramban with 12.8 per cent and Kishtwar tehsils with 10.00 per cent. Interestingly enough in Kishtwar tehsil the proportion of cultivated area under double cropping is highest accounting for 48.1 per cent of its net sown area.

A little more than 34 per cent of the net sown area of Doda tehsil is cultivated twice followed by Bhaderwah with 21.4 per cent and Ramban with lowest proportion under double cropping - 3.3 per cent of its net sown area.

(i) **Forest Lands**:

Since the area is hilly and mountainous most of the village paper area is under the forests. Most of the area under forests is found in Kishtwar tehsil followed by Ramban and Doda tehsils. Bhaderwah tehsil has lowest proportion of revenue area under forests. In Ramban and Doda tehsils there has been a gradual decline in the proportion of forest area from 1961 to
1979. In Kishtwar tehsil this proportion remained almost constant from 1961 to 1974 but experienced a slight decline between 1974-1979. In Bhaderwah tehsil there has been a sharp decline from 1961 to 1974. However, a slight increase was noticed in the period 1974-79.

At the level of revenue circles the regional variations are much more pronounced. The proportion of forest area is more than 50 per cent in 24 circles none of which is located in Bhaderwah tehsil (Appendix VII). Most of these circles are concentrated in Ramban and Kishtwar tehsils (Table VI.2). This proportion is higher in the north, northeast and western sectors of the region, whereas it declines towards the south (Fig. 6.1).

(ii) Area not Available for Cultivation:

Next to the forest area a sizeable area is just not available for cultivation because of poor terrain. The proportion of such area has gradually declined over the years in almost all the tehsils of the region. The main reason is that bringing such lands under productive use is an expensive exercise. In Kishtwar tehsil the proportion of such area declined from 12.4 per cent in 1961 to 10.3 per cent in 1979. In Doda tehsil it was
18.9 per cent during 1961 and reduced to 9.07 per cent by the year 1979. In Bhaderwah tehsil the proportion of area not available for cultivation was 38.7 per cent in 1961 which came down to 30.2 per cent by the year 1979. In Ramban tehsil the proportion of such area has fluctuated over the years between 13.3 per cent in 1961 to 12.5 per cent in 1971 and 15.4 per cent in 1979. The increase in the proportion of such area in Ramban tehsil is also due to landslides which often occupy the cultivated land rendering it useless.

(iii) **Fallow Land other than Current** :

The proportion of fallow land is very low. Moreover, the fallow land has declined especially after 1974. In Kishtwar tehsil it decreased from 7 per cent to 6.45 per cent during 1971-74 but it came down to 0.12 per cent in 1979. In Bhaderwah and Doda tehsils the proportion of such area increased during 1961-74, it experienced a sharp decline during 1974-79 (Table VI.2). In Ramban tehsil there has been a gradual but continuous decline from 1961 to 1979.

(iv) **Current Fallow** :

This represents cropped area which is kept fallow for the current year. Area under current fallow decreased from 1971 to 1974 but experienced a slight
increase during 1974-79 in the region. In Kishtwar, Bhaderwah and Doda tehsils the proportion of area under current fallows decreased during 1961-74 but increased during 1974-75, whereas, in Ramban tehsil it has fluctuated from year to year. In Bhaderwah tehsil 5.6 per cent of the revenue area was under current follow during 1961 which decreased to 0.3 per cent in 1974 but again rose to 3.9 per cent in 1979. In Doda tehsil too it came down from 3.8 per cent in 1961 to 0.23 per cent in 1974 and rose to 2.6 per cent in 1979 (Table VI.2).

(v) **Pasture Lands**

This includes all grazing lands, permanent pastures and meadows. The area under permanent pastures is highest in Kishtwar tehsil followed by Ramban and Bhaderwah tehsils. The area under pastures has increased during 1974-79 in all the tehsils. In Kishtwar tehsil the proportion of area under pastures decreased during 1961-74 from 1 to 0.06 per cent but went upto 4.00 per cent during 1974-79; in Bhaderwah tehsil it increased from 0.8 to 3.5 per cent during 1971-79 (Table VI.2). In Doda and Ramban tehsils also the pasture land accounted for 0.2 per cent of the total area during 1974 increasing to 1.7 and 3.6 per cent respectively in 1979.
(vi) **Culturable Waste**:

It includes all such lands which are available for cultivation, but not taken up for cultivation continuously for more than five years. The proportion of culturable waste land has declined in the region from 13.6 per cent in 1961 to 5.81 per cent during 1979. In Baderwah, Doda and Ramban tehsils the proportion of area under culturable waste remained fluctuating between 1961 and 1974 but decreased sharply during 1974-79. In Kishtwar tehsil it declined continuously from 1961 to 1979 (Table VI.2).

An interesting pattern observed in the region is that the average culturable waste land per village increases continuously with the increasing distance from the urban centres, whereas the average cultivated land per village declines. So far as the total area is concerned it increases up to a distance of 25 kilometres under culturable waste as well as under cultivation and then there is a continuous decline with distance in both the cases. Upto a distance of 50 kilometres the culturable waste remains below the cultivated area, whereas beyond that culturable waste moves above the cultivated area in a declining trend.
(vii) **Net Sown Area**

The net sown area has reported an increase in the period 1961-1979. A little more than 13 per cent of the total area was under cultivation in 1961 which increased to 14.63 per cent in 1969. It further went up to 14.76 per cent by 1974 and reached 15.79 per cent by the end of 1979. Bhaderwah tehsil has the highest proportion of net sown area accounting (37.4 per cent) followed by Doda (15.65 per cent) and Ramban (12.85 per cent). Kishtwar tehsil has the lowest proportion of net sown area which is as low as 10.06 per cent (Table VI.2). Although the area under cultivation has increased in all the tehsils, this increase has been rather slow.

The proportion of net sown area to village paper area is above 50 per cent in three halgas* two of which are located in Bhaderwah tehsil, namely, Kursari and Nagar and one in Doda tehsil, viz., Bhart. In 11, five of which are situated in Kishtwar tehsil and 3 each are located in Ramban and Doda tehsils, the proportion of net sown area is less than 10 per cent (Appendix VII). The proportion of net sown area to village paper area is higher in southern and central parts of

* **Halga** is the local term for a revenue circle.
the region and has displayed a decreasing trend towards
the east, north and west (Fig. 6.2).

(Viii) Irrigation:

The system of irrigation practised in the region
is peculiar to hilly and mountainous tract. From vari­
ous streams diversion channels are taken out along the
slopes. They are locally called 'kuhls', At each level
these 'kuhls' thus deliver the water to the fields.
However, due to topographical constraints, irrigated
area is very small. It accounts for about 9.7 per cent
of the total cultivated area of the region.

Kishtwar tehsil has the highest proportion of
area under irrigation. The tehsil accounts for about 32
per cent of the total irrigated area of the region. It
is followed by Doda tehsil with 28 per cent, whereas,
it is almost uniform in Bhaderwah and Rambantehsils-
about 20 per cent each. Bhaderwah tehsil has 9 per cent
of its net sown area under irrigation, whereas, it is
lowest in Ramban tehsil (8.2 per cent).

As pointed-out above, 'kuhls' are the only source
of irrigation. Out of the total irrigated area in the
region about 10 per cent is irrigated through 'kuhls'
constructed by the irrigation department, whereas, the
rest of the area is irrigated by Zamindari kuhls. The departmental canals irrigated 1,446 acres of area during 1975, whereas it increased to 1,885 acres in 1978.

Variations in irrigated area are very high at the village level. The cultivated land in 147 villages is not irrigated at all. In 300 villages the proportion of irrigated area to gross cropped area ranges between 0 to 10 per cent. It is only in 29 villages that the proportion of irrigated area exceeds 50 per cent. Maximum number of villages with no irrigated land are situated in Bhaderwah tehsil alone accounting for 51.02 per cent followed by Kishtwar tehsil with 24.48 per cent.

In Ramban tehsil the proportion of irrigated area in about 70 per cent of the villages having irrigation is as low as 10 per cent. In Bhaderwah tehsil 67.33 per cent of the irrigated villages have less than 10 per cent of their gross cropped area under irrigation. Doda tehsil has 55 per cent of the villages in the same category.

Evidently, the major dependence of agriculture on natural somes of moisture flows from the environmental factors and reveals the essentially primitive nature of agrarian economy.
In 1971 the irrigated area accounted for 9.7 per cent of the gross cropped area which increased to 12.1 per cent by the year 1979. But this proportion is too poor from any standard for the application of new technology. There have been vide variations in the proportion of irrigated area, at circle level. In three halgas

TABLE VI.3

Irrigated Area Percentage to Gross Cropped Area

<table>
<thead>
<tr>
<th>Tehsil</th>
<th>Tehsil-wise Grouping of halgas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Kishtwar</td>
<td>6</td>
</tr>
<tr>
<td>Bhaderwah</td>
<td>6</td>
</tr>
<tr>
<td>Doda</td>
<td>14</td>
</tr>
<tr>
<td>Ramban</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
</tr>
</tbody>
</table>

E.g., Nagar and Sungli in Bhaderwah tehsil and Desa in Doda tehsil, the proportion of irrigated area is above 50 per cent (Table VI.3). In five halgas, i.e., Paddar, Naugam, Dolegam, Zanihal and Choka it ranges between 25 and 50 per cent. In 35 halgas the proportion of irrigated area is below 10 per cent. There is a predominance of irrigated area in the side-valleys (Fig. 6.3).
VI.1.4 Cropping Pattern:

There are striking intra-regional variations in altitude and climate, which make it possible to cultivate almost all the major crops. However, the quality and quantity produced is exceedingly poor as their cultivation is not possible on the same scale due to altitudinal and climatic constraints. At best one can say that the tillers of the soil struggle hard to earn their bread for sustenance. Here and there some patches of greenery can be observed producing rice, maize, wheat, millets etc. Agriculture is mainly subsistence in character and the commercial tendencies are rare, although not altogether absent. Neeru valley and Bichlari valley are noted for paddy. Assar-Baggar tract is well known for its vegetables which are even exported to Jammu.

The subsistence nature of agriculture is evident from the fact that the cultivated area is dominated by food crops, such as maize, paddy, and wheat. Maize is the staple food crop. Other cereals such as, gram, kodra or grim are grown in areas at higher altitude. About 7 per cent of the total cropped area is devoted to these crops. At tehsil level the highest proportion under these crops is found in Kishtwar tehsil with 12.81 per cent of the total cropped area. In Doda and Bhader-
wah tehsils it accounts for 9.41 and 4.03 per cent respectively. The lowest proportion 0.75 per cent is recorded in Ramban tehsil.

Area under millets accounts for 11.44 per cent of the total cropped area of the region. Here again the Kishtwar tehsil has 29.58 per cent of its area under millets followed by Doda tehsil with 8.86 per cent, Bhaderwah tehsil with 4.56 per cent and Ramban with 0.61 per cent.

(i) **Maize** is the staple food of the people in the region. Maize cultivation extends over 58.58 per cent of the gross cropped area. In as many as 33 halqas, area under maize accounts for more than 75 per cent of the gross cropped area. It is only in two halqas that the proportion of area under maize is below 25 per cent. These two halqas are situated in Kishtwar tehsil, namely, Paddar and Marwah. In Paddar the area goes under trumba, rice, buck wheat and grim, whereas in Marwah it is given to trumba and grim. The proportion of area under maize declines towards the north and east (Fig. 6.4).

(ii) **Pulses:** Pulses such as rajmah, and mash are cultivated throughout the region with varying degrees of concentration. In the lower altitude zones of Bhaderwah and Doda mash and rongi are quite common, whereas the
Himalayan Chenab Basin in Jammu & Kashmir
HALQAWISE AREA UNDER PULSES
PERCENTAGE/TOTAL CULTIVATED AREA
1978-79

INDEX
Area in Percentage
- 25 - 50
- 10 - 25
- BELOW 10

Fig 5
TABLE VI.4
Area Under Maize % to G.C.P.

<table>
<thead>
<tr>
<th>Tehsil</th>
<th>Tehsilwise Grouping of Halgas</th>
</tr>
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<td></td>
<td>10%</td>
</tr>
<tr>
<td>Kishtwar</td>
<td>-</td>
</tr>
<tr>
<td>Bhaderwah</td>
<td>-</td>
</tr>
<tr>
<td>Doda</td>
<td>-</td>
</tr>
<tr>
<td>Ramban</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
</tr>
</tbody>
</table>

Higher altitude areas of Bhaderwah have a preference for rajmash cultivation. The proportion of area under pulses decreases towards the peripheral areas of the region (Fig. 6.5).

(iii) Orchards: Area under orchards has been increasing gradually in the region. At present Bhaderwah tehsil has the highest proportion of area under orchards (14.73 per cent) followed by Doda (12.74 per cent) Ramban (6.58 per cent) and Kishtwar (6.06 per cent).

During 1971-79 the proportion of area under orchards has increased from 2 per cent to 6.06 per cent in Kishtwar; from 2 to 6.5 per cent in Ramban; from 9.1 to 12.74 per cent in Doda. The highest increase has been recorded
Himalayan Chenab Basin in Jammu & Kashmir
HALQAWISE AREA UNDER RICE
PERCENTAGE TO TOTAL CULTIVATED AREA
1978-79

INDEX
Area in Percentage

- 50 to 75
- 25 to 50
- 10 to 25
- BELOW 10

Fig 6 6
in Bhaderwah tehsil where the area under orchards increased from 2.75 per cent to 14.74 during 1974-79. The proportion of area under orchards is above 10 per cent in four halqas only, viz. Batote in Ramban tehsil, Nagar and Kurasari in Bhaderwah tehsil and Pranu in Doda tehsil. In all other halqas it is less than 10 per cent. In as many as 12 halqas it is less than 1 per cent whereas in halqas like Mangota and Batyas no area under orchards has been recorded. Generally the proportion of area under orchards is higher in the southern sector and decreases towards the north and east.

(iv) Rice: Although maize is the major cereal crop of the region yet rice is grown in almost all the halqas with varying intensity. Intra-Halqa variations are also high which can be exemplified by Dachla halqa where rice is cultivated in 7 out of 15 villages in Kishtwar halqa it is cultivated in 2 out of 12 villages, and in Marwah rice is cultivated in 2 out of 11 villages. Four halqas have returned no area under rice - two each in Bhaderwah and Kishtwar tehsils. In two circles, viz. Nagar and Kurasari in Bhaderwah tehsil the rice area accounts for 61.33 and 52.5 per cent respectively, of the gross cropped area. In Kishtwar tehsil maximum area under rice has been returned from paddar (Fig. 6.6).
(v) **Area Under Trumba, Kodra and Grim:** Trumba, kodra and grim are the cereals of the people living in higher altitude zones. These crops are sown in 39 halqas. In 25 halqas they are cultivated over less than 10 per cent of the gross cropped area, whereas in two circles the proportion of area is above 50 (Table VI.5). The halqas with highest proportion of gross cropped area under these crops are Marwah and Dachhan in Kishtwar tehsil. In Paddar and Pesa too the proportion of area under these crops is quite high. It can be observed that the incidence of area under these crops is higher towards the north and eastern areas of the region.

**TABLE VI.5**

<table>
<thead>
<tr>
<th>Tehsil</th>
<th>Tehsilwise grouping of Halqas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10%</td>
<td>10-25%</td>
</tr>
<tr>
<td>Kishtwar</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Bhaderwah</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Doda</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Ramban</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

**VI.2 REGION ANALYSIS OF CONCENTRATION OF VILLAGES:**

**HA LQA LEVEL:**

A striking characteristic of the distribution
pattern of land as a resource is reflected in the regional patterns of concentration and clustering of villages. An attempt has been made to describe these patterns at the Halqa (revenue circle) level. The concentration of villages in itself may be considered as an important indicator of the land and its potential as a resource for agricultural development. There are 648 inhabited villages, grouped into 61 revenue halqas. The grouping of villages into halqas has been done on the basis of the area. There are a number of single village circles such as Desa, Bibrota, and Mundhar; at the same time there are circles with as many as 25 very small villages. The halqas with a large number of villages have clusters of settlements. Most of these villages are of very small size. For example in Bhaderwah tehsil half of the circles have more than 20 villages, 21.8 per cent villages have less than 100 inhabitants. It has also been observed in the Bhaderwah tehsil the average area of a village is too small accounting for 110 hectares (291 acres). Generally it can be observed that the proportion of villages is higher in

17. Halqa is a revenue area under the jurisdiction of a patwari. According to the revenue department a 'Fatwar Halqa' is demarcated on the basis of the area of the villages.
holidays situated in the valley bottoms of Neeru basin, Kalnai basins, Bhutna basin and in north central part. Southwestern sector of the region is dominated by the holidays of small number of villages (Fig. 6.7). The concentration of villages in the side-valleys of Chenab is associated with the concentration of cultivable land in these valleys.

The region can be divided into four categories of holidays on the basis of concentration index of villages. Holidays included in the upper quartile are found in four blocks. One of these blocks is situated in the south of the region in Neeru valley, another block is situated around Thathri and whole of the Kalnai valley is included in the upper quartile. Paddar and Dachhan too fall in the first quartile. The second quartile circles have a major concentration in a block in the middle. Another important block of second quartile holidays is observed in Bhaderwah tehsil. Marwah forms a separate block of second quartile holidays in the extreme north of the region. There are three other minor clusters of the holidays in the second quartile situated on the national highway in the vicinity of Batote, Ramban and Banihal towns. The holidays of the third quartile are clustered in two major blocks one in the extreme western part of the region, i.e., Ramban tehsil and the other continuous block is
found in the centre of the area mostly in Doda tehsil. Other minor clusters of third quartile halqas are Jakiyas in the extreme east, Dolegam in the north-west and Parbal in the south. The fourth quartile halqas are mostly found in Doda and Ramban tehsils. One major block of the fourth quartile halqas is found in Doda tehsil. Two other important blocks are concentrated in north west and one in the southern part of Doda tehsil.

VI.2.1 Halqawise Patterns in Net Sown Area:

Net sown area follows by andlarge the same pattern as the gross cropped area. Net sown area is highly concentrated as about half of it is concentrated in 25 per cent of the halqas. Concentration index has been calculated and the halqas have been quartiled for mapping. Highest concentration of net sown area is found in the first quartile halqas which are found in four important clusters. The largest block of first quartile halqas runs from Dachhin to Bhart in Doda tehsil and continues upto Gando in Bhaderwah tehsil's second important concentration is found in the side valley of Neeru, third cluster is found in Batote-Chanderkot tract and the fourth important cluster includes Dachla and Sharoli halqas of Kishtwar. Lastly there is a minor cluster of first quartile halqas north of Banihal town. Halqas of the second quartile are unevenly distributed all over
Himalayan Chenab Basin in Jammu & Kashmir
NET SOWN AREA

Index
4.28 UPPER LIMIT
2.15 UPPER QUARTILE
1.54 MEDIUM
0.81 LOWER QUARTILE
0.20 LOWER QUARTILE

10 10 10 10 KMS
the region with three important clusters, one of which is located in the western part, a second in the extreme north and the last in the extreme east (Fig. 6.8). The third quartile halgas are concentrated in three main blocks, around Kishtwar, Doda and the Kalnai basin. Two minor clusters are also found in Neeru valley. The fourth quartile halgas are found in two separate blocks one consisting of Jakiyas halga and the other in the western part of Ramban tehsil.

VI.2.2 Halqawise Patterns in Gross Cropped Area:

Cultivated area is also concentrated in the halgas situated in the side valleys. The availability of the cultivable land in the side valleys is associated with the degree of slope which is relatively gentle in the side-valleys. Apart from slope, climate is a major determinant of gross cropped area. A little more than 45 per cent of the cultivated area is concentrated in 25 per cent of the circles.

To highlight the regional variations in cultivated area a concentration index has been worked out for 61 halgas and quartiling has been done for plotting on the map. The halgas of the first quartile have highest concentration of cultivated area. These halgas are clustered in four blocks. One major block runs conti-
nuously from Dachhan to Desa, along the northern fringes and down to Doda and Thathri. Another important block is found in Neeru valley. The Sharoti area of Kishtwara tehsil is also included in the first quartile. One more important cluster is observed near Batote (Fig. 6.9). Halgas of the second quartile are found in various patches scattered all over the region. Most important clusters of the second quartile halgas are found in the western areas followed by Marwa in the north and Paddar in the west. Another important block of second quartile halgas is found around the town of Kishtwar. The third quartile halgas are concentrated in four blocks. The major concentration of third quartile halgas is found in a continuous block extending from Assar to Pranu along south-western fringes of the region. Another important cluster of these halgas is found in the south-eastern part. There are two other minor concentrations one towards the south-east of Kishtwar and another around Ramban town. Fourth quartile halgas have a major concentration in the middle of Doda tehsil. There are several other patches of fourth quartile halgas well distributed throughout the region.

VI.2.3 Halgawise Patterns in Irrigated Area:

A little more than 70 per cent of the irrigated area is concentrated in 25 per cent of the halgas. Nagar Bhaderwah and Desa halgas account for about 25 per cent of the irrigated area. Irrigated area is entirely concen-
Himalayan Chenab Basin in Jammu & Kashmir
HALQAWISE CONCENTRATION OF IRRIGATED AREA
1978-79

Fig 6.10
trated in the side valleys. The halqas of the first quartile are fairly evenly distributed. Of the first quartile halqas Marwah and Paddar form two compact blocks in the north and east respectively. Another important block runs from Chhatroo to Desa and runs along the right bank of Chenab to Keshwau, Kilhotran, Bhaderwah and Banihal. The second quartile halqas are distributed unevenly. The major cluster is found in Kishtwar and Dachhan. Three minor clusters, are found in the peripheral areas of Ramban tehsil. In Bhaderwah tehsil too there are two minor clusters one in the Ruggi basin and the other in Kalnai basin. The third quartile revenue halqas are found in three blocks. The largest concentration is found in the central part of the region (Fig. 6.10). Another important cluster is found in Ramban tehsilextending from Batote to Ramban and Tanger in the extreme west. There is another minor concentration in the southern part of Doda tehsil. The fourth quartile halqas are also widely scattered all over the region most of which are located in Neeru, Kalnai and Bichlari valleys. In Neeru valley, Kanso, Bajja, Khe­leni and Kahlote form a compact block. Champal, Jakiyas, Jaora and Chawasar also form a compact block in the south-west.
Himalayan Chenab Basin in Jammu & Kashmir
HALQWISE CONCENTRATION OF AREA UNDER MAIZE
1978-79

Fig 6.11
VI.3 CROPPING PATTERN BY HALQAS:

VI.3.1 Area Under Maize:

Maize, the staple food of the people of the region, is grown in all parts of the region. At the end of the year 1979 as much as 1,10,992 acres of area was under maize cultivation. At the halqa level there have been marked variations in the concentration of the area under maize. The concentration index reveals that about one half of the area under maize is concentrated in a little less than 25 per cent of the halqas. The halqas of the first quartile form two major compact blocks, one of which runs from Chhatroo along the northern periphery uptoo Desa and down to Kahlote and over to Bajja. Another important block comprises Kruol and Sharoti halqas. There are two other important clusters of the first quartile halqas, one comprising Batote and Rajgarh and the other Sarbangni and Deogol halqas. Second quartile halqas are found clustered in three areas. An important cluster consisting of Dachhan, Ohli, Dachla and Mahala form a compact block. Another important concentration consists of Kursari and Kanso halqas. Ramban, Tanger, Khanga, Dhandhrote and Paristan also form a compact block (Fig. 6.11). The halqas of the third quartile are scattered in the south and the central parts of the region. Fourth quartile halqas are found in four major

18. The data is based on the Go-Shwara-Jinswar available with the patwaris.
Himalayan Chenab Basin in Jammu & Kashmir
HALOAWISE CONCENTRATION OF AREA UNDER RICE
1978-79

Fig. 612

Index
15.63
11.0
9.73
8.30
6.03

UPPER QUARTILE
UPPER QUARTILE
MEDIAN
LOWER QUARTILE
LOWER LIMIT

VI.3.2 **Area Under Rice**

Rice is grown in almost all parts of the region with varying intensity. The total area under rice cultivation amounted to 11,645 acres in 1979. The concentration index reveals that about 75 per cent of the total area under rice concentrated in 15 *halqas* only. The *halqas* of the first quartile are unevenly distributed in the region mostly limited to the valleys of Neeru, Kalnai, Bhutna, Maru-Warwan, Desa, Ruggi and Bichlari streams. Dachhan and Chhatroo *halqas* form a compact block in the Maru-Warwan valley, Paddar is an outlier in the extreme east. In the west Deogol, Dolegam and Zanihal form a compact block of first quartile *halqas*. In Neeru valley Nagar, Kursari and Sungli form a compact block (Fig. 6.12). The second quartile *halqas* are found in four blocks, the largest of which is found in the west comprising Ramban, Tanjer, Khanga, Sarbangni and Ganote. Another important cluster is situated in the middle and Chinta in the south is also included in the second quartile. The third quartile *halqas* are scattered all over
the region. Fourth quartile halqas are found in three compact blocks one in the south, another in the south-west and the third in the north-west. The south eastern concentration is comprised by Kilhotran and Gando halqas; the south-western concentration includes Kalhote, Dhara, Parbal, Pranu, Kanso, Mangota, Bayota and Goha halqas. In the north-west Dhandhal, Paristan, Pogal and Bibrota form a compact block. Moh-Mangat is an outlier in the north-west. The halqas of the fourth quartile account for 3.12 per cent of the total area under rice cultivation.

\[1.3.3\] Halqawise Concentration of Area Under Pulses:

Quite a large proportion of area is under pulses amounting to 16,884 acres. The concentration index shows that more than 56 per cent of the area under pulses is concentrated in one-fourth of the halqas. The first quartile halqas are found in a continuous belt extending along the river Chenab from Batote to Krool in Kishtwar running in an east-west direction (Fig. 6.13). The second quartile halqas form the compact blocks one in the north of Kishtwar and the other in the south-west comprising Roate, Assar and Goha. Third quartile halqas form a compact block in the east and consist of Jaora,
Himalayan Chenab Basin in Jammu & Kashmir
HALQAWISE CONCENTRATION OF AREA UNDER WHEAT
1978-79

INDEX
% Concentration of Area
18.34  UPPER LIMIT
6.85  UPPER QUARTILE
3.36  MEDIAN
1.48  LOWER QUARTILE
0.16  LOWER LIMIT

Fig 8.14
Shoroti, Dachla, and Ohli. In the south-east Kilhotran and Gando also form a compact block. Batote, Rajgarh and Gagla too form a compact of theird quartile halqas in the south-west. Fourth quartile halqas are found scattered all over the region. Ramban, Khanga and Ganota are the fourth quartile halqas producing pulses.

Rajmash is the major crop which is produced as a marketable surplus.

VI.3.4 Halqawise Concentration of Area Under W heat:

Wheat is grown in 23 halqas of the region over an area of 14,110 acres. Most of these halqas are concentrated in a belt running from east to west in the middle of the region. The highest concentration of area is found in Kishtwar, Batote, Ramban and Khanga halqas. The second quartile halqas are found in a compact block in Doda tehsil consisting of Bajarni, Arnora, Kunddhar, Khali and Gagla halqas. Third quartile halqas are also found in one compact block including Kahlotte, Dhara, Bhart, Gando and Dachla halqas. (Fig. 6.14). The fourth quartile halqas are found scattered all over. The wheat is of generally poor quality in the region and is usually grown in areas where irrigation is not possible.
Himalayan Chenab Basin in Jammu & Kashmir
HALQAWISE CONCENTRATION OF AREA
UNDER ORCHARD
1978-79

Fig. 6.15
VI.3.5 *Halqawise* Concentration of Area Under Orchards:

The region is climatically suited to horticulture and as a result the area under orchards is distributed throughout the region. According to the concentration of area under orchards a little more than 62 per cent of it is concentrated in 14 *halqas*. The *Halqas* of the first first quartile are situated in the peripheral zones of the region. Dachhan and Chhatroo form a compact block in the north, Sharoti and Krool in the east, Nagar and Kursari in the south, Batote in the south-west and Nagaun in the north-west are the major concentrations (Fig. 6.15). The second quartile *halqas* are also scattered all over the region Arnora, Chaka, Munddhar and Gagla form a prominent compact block in the western sector of the region. The third quartile *halqas* form a cluster in the west consisting of Banjhal, Zanijal, Sarbangni and Tanger. Third quartile *halqas* form a continuous block in the west consisting of Rajgarh, Dhandhal, Khanga, Paristan, Pogal and Ganot *halqas*. Another concentration is found in the middle in Kahloote and Bajja. Kilhotran and Parbal in the south are the other *halqas* of the lower quartile.
The area under orchards is small presently, but it is gradually increasing.

It can be concluded that the major stress in the region is on food crops. There is very little scope for the development of irrigation due to physical factors.

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