

## CHAPTER XI.

### AGRICULTURE, LIVESTOCK AND IRRIGATION.

The district comprises of three subdivisions, viz., Sadar, Giridih and Chatra. Except a stretch of level land extending from Chauparan, Kodarma, Dhanbad and Kharagdiha to Giridih the district is full of hills and jungles and intersected by numerous hills. The slopes and stream-beds have been terraced in cultivation and the darker lower lands are richer than the reddish uplands.

#### SOILS.

There has been no detailed soil survey of the district and hence only a general description of the soils could be given.

Many kinds of soil, namely, gravelly soils, sandy loam, red ferruginous loam, river alluvium and even black sticky clay are found, which show on the average 0.05 per cent Nitrogen, 0.001 per cent Phosphate, 0.010 per cent Potash and 5.5 to 6.8 per cent, the maximum value of Nitrogen being 0.106 per cent and the minimum 0.027 per cent.

According to the commonly accepted terminology the soil of the district can roughly be classified into three categories, namely, (1) *kewal*, (2) *lalki matti*, (3) *dudhiya matti*. *Keval* soil is dark grey in colour and is the most fertile in the district. With the help of the common manure of cowdung or compost and chemical fertilisers it has yielded up to 120 maunds of paddy per acre. The red soil is more common in the district and grow maize, *bajra* and *arhar* during *khari* season and *surgujiya* (oil-seed) during *rabi* season. If irrigational facilities are available paddy could also be grown on red soil. *Dudhiya matti* or calcareous soil has an excess of lime and could only be cultivable with the help of a profuse quantity of cowdung and other organic materials.

In the last District Gazetteer of Hazaribagh published in 1917 Lister has classified the land of the district under two broad heads, namely (a) *Don dhan-khet*, terraced or wet land, and (b) Uplands, *tanr*, dry cultivation. He made three classifications under both the categories of land and gave the following statistics:—

- (1) *Don first class*.—The total area was mentioned as 70,366 acres.
- (2) *Don second class*.—This was also known as *dorosa*, *kanali*, *singha* and *gogry* lands with an area of 1,16,483 acres.
- (3) *Don third class*.—This was also known as *Tarakla* or *Tarnkhet* with an area of 3,08,497 acres.

Since the publication of the last District Gazetteer much of this classification has naturally changed owing to more intensive and continued cultivation. A large percentage of third class *Don* lands have been by now transformed into first or second class *Don* lands. Similarly *Don* second class may have been converted by now into *Don* first class by better irrigational facilities, construction of *aills* and use of manures. Some land has also gone out of cultivation.

AGRICULTURAL STATISTICS.

Lister gave the following statistics for uplands or *tamr* lands for dry cultivation.—

- (1) *First class*—known as *bari* or *charbari* including the few plots of land on the level of the river bed which grow sugarcane. The area under this head was 83,364 acres.
- (2) *Second class*—known as *bhila* lands and covers an area of 3,73,435 acres.
- (3) *Third class*—known as *tamr* with an area of 3,37,146 acres.

There have been no survey and settlement operations since 1917 when the last District Gazetteer of Hazaribagh by Lister was published. The present available agency for collecting statistics does not follow Lister's classification of lands.

The agricultural statistics of Hazaribagh district according to the last District Gazetteer (1917) are as follows :—

(1) Total area	...	...	44,71,132 acres or 6,986 square miles.
(2) Forests	...	...	25,24,590 acres or 3,945 square miles.
(3) Not available for cultivation.			3,65,298 acres or 571 square miles.
(4) Cultivable waste (other than fallow).			2,66,263 acres or 416 square miles.
(5) Current fallow			3,43,497 acres or 599 square miles.
(6) Net cropped	...	...	9,31,542 acres or 1,445 square miles.

The area of land not available for cultivation is exclusive of forest lands unfit for cultivation. If these be added, the total area permanently unfit for cultivation is 3,004 square miles.

Current fallow includes—

- (a) Land ordinarily cultivated each year, but left uncultivated in the year of record.
- (b) " It is the custom of the district to leave *tanr* lands fallow from time to time. The cycle of years according to which the lands are cropped has been recorded in the case of each field, and reckoning made accordingly. Thus a field of three acres only cropped once in three years, will appear as three acres in the gross column and as one acre in the net column." The balance of these two areas is shown above as current fallow.

The recent (1953) agricultural statistics collected by the Agricultural Statistics Section of the Revenue Department either through sample survey or by eye estimation or national sample survey are as follows :—

	Acres.
(1) Cropped area	11,75,184
(2) Current fallow	4,58,433
(3) Cultivable waste	4,80,442
(4) Orchard	2,682
(5) <i>Gairmazarua</i> (tanks, houses, etc.)	6,22,358
(6) Uncultivated waste	18,17,451
Total	45,56,550

The cropped area expressed in thousand acres now consists of paddy (6.78), wheat (2), gram (18), barley (14), maize (1.01), *masoor* (2), *arhar* (21), *khesari* (5), peas (5), sugarcane (9), potato (9) and chillies (10). *Marua*, *goondli* and oil-seeds also occupy some lands.

#### AGRICULTURAL SEASON.

The main agricultural seasons in the district are three, namely, (1) *kharif*, (2) *rabi*, (3) *zaid*.

*Kharif*.—The *kharif* season starts from the third week of May and lasts till the end of October. The main crops grown in this season are paddy, *bajra*, *marua*, maize, *arhar*, etc. Most early varieties of paddy are grown by broadcast method and the seed required is about half a maund per acre. Recently Japanese method of paddy cultivation has been introduced in the district. It is claimed that in some of the areas put under Japanese method of rice cultivation the yield has doubled and has recorded about 30 to 40 maunds of crop per acre. The yield of other crops, i.e., maize, *marua* and *arhar* comes on the average 5 maunds per acre.

*Rabi*.—The season starts by the end of October and lasts up to the last week of February. The main crops grown during the season are *surgujiya* wheat, gram, mustard, barley, potato, etc. The area sown in this season comes to 1,48,000 acres. Lack of irrigational facilities and stray cattle are some of the reasons that stand in the way of increasing the acreage. Attempts are being made by the Agricultural Department to encourage the cultivators to take the double crop by holding demonstrations of both wheat and *paira* gram. In double cropping mustard seed is put after maize and wheat after paddy. The variety for wheat recommended is the variety known as NP. 52. The variety has been found good in other respects except in threshing. The other varieties of wheat that take to the soil are BR. 319, NP. 761, 755 and 799. The average yield of *surgujiya* is 3 maunds per acre.

*Zaid*.—During this season from the beginning of March up to the second week of May people grow mostly vegetables, like *kadu*, *kohra*, *bhindi*, french beans, etc. Two vegetable belts have been encouraged in the district. One is within the radius of five miles of Hazaribagh and another round about Giridih. The total area of the vegetable belts of the district is about 1,700 acres. Vegetables are also grown in the winter and rainy seasons. There is a great scope for more vegetables to grow in this district.

#### SEED.

As improved seeds will considerably add to the yield, tested seeds from the Government Farm Research Station of Sabour and Pusa are distributed to the cultivators. The cultivators are encouraged to select a particular plot and grow crops from the tested seeds as distributed by the Agricultural Department on condition that half of the yield should be given to the department as seeds. In this way it is expected that there will be provisions for more of better types of seeds.

The recommended varieties of seeds for the main crops of this district are as follows:—

Paddy—BK. 115, BK. 36, BK. 141, BK. 88 and Kanke II.

Wheat—NP. 52, NP. 761, BR. 319.

*Arhar*—Tumur variety, BR. 65.

Gram—S. 4.

Sugarcane—B. O. 17 and B. O. 419.

Barley—BR. 22.

Maize—Kalimpong and Jaunpur.

and the ...

p to the  
ason are  
sown in  
ties and  
creasing  
artment  
lemons-  
mustard  
wheat  
as been  
eties of  
The  
  
to the  
kohn,  
uraged  
ribagh  
etable  
own in  
vege-

seeds  
are  
select  
ed by  
ould  
that  
  
this

AGRICULTURAL IMPLEMENTS.

The main agricultural implements that are in vogue in this district are indigenous ploughs and heavy wooden planks (*patta* or *hanga*). These implements do not generally attain the necessary tilth in the soil, as is expected of mould board ploughs.

The ploughs that are recommended by the Agricultural Department, that is, the Bihar Junior and Senior ploughs are used by the cultivators to a very limited extent. The main difficulty in this connection is the poor draught capacity of the local bullocks.

Some of the big farmers are using tractors now. Tractor cultivation will be economic and useful only if the plots are large. The scope for mechanised cultivation is, however, limited. Owing to the inheritance laws of the country after the death of the recorded tenant his lands are likely to be subdivided. It is only such land-owners who have got big plots of land that can employ a tractor. There are also difficulties in getting properly trained tractor personnel. Facilities for repairs of tractors or replacement of tractor parts are not adequate.

MANURE.

The last District Gazetteer shows that there was no other manure available in the district than the cowdung. Recent experiments have been going on to find out the particular type of manure that will be suitable to the different soils in different areas.

In recent years there has been more use of rural compost, town compost, and green manure. Chemical fertilisers, such as ammonium sulphate, superphosphate and bonemeal have been introduced and the agriculturists are slowly taking to them. The chemical fertilisers require a lot of water and there can only be more use of chemical fertilisers provided there are proper irrigational facilities.

Green manuring is also done. Practically green manure was not known in the district sometime back. *Sanai* is used for uplands and *dhaincha* for lowlands. The cultivation of *berseem* is coming into vogue both for green manuring and as a fodder for the cattle.

Compost schemes both in rural and in urban areas have been useful. In the rural area cowdung is largely used for this purpose and the villagers are getting compost minded. Town compost schemes based on night-soil and refuse of the town have been successful at Hazaribagh, Giridih and Ramgarh Cantonment areas. Cultivators are supplied town compost from the depots of these places. On chemical analysis, the town compost of Hazaribagh Depot has been found to contain 10 per cent of Nitrogen and 5 per cent of Phosphate and has had very good results on many crops specially vegetables.

## PLANT PROTECTION.

A Plant Protection Unit of the Agricultural Department has been working since 1951. Insecticides and fungicides have been also placed at the disposal of the Agricultural Inspectors in each subdivision, to tackle the problem, in case of emergencies. These depots have been also given modern dusters and sprayers for the purpose. There are four outstanding plant protection problems in this district.

## STORAGE OF POTATO AND GRAINS.

Potato tuber moth is prevalent in this district and it destroys the crops by making holes in the tuber. At the time of storage it again damages the tuber when the larva dig tunnels in them and thus render them useless for seed purpose. Due to the lack of facilities for cold storage the cultivators have to fall back upon indigenous methods and thus they lose a good deal of potato.

## PESTS IN PADDY.

The most important pest here is the *gundhi* bug. In the year 1952-53 it created a havoc and hundreds of acres of paddy crop were threatened. The *gundhi* bug sucks the juice of the grains and thus renders them useless. It starts in a virulent way and unless prompt measures are taken, the whole area is threatened.

## CONTROL OF MANGO HOPPERS.

Mango hoppers suck the juice at the time of flowering and render the flowers incapable of producing any fruit. As a preventive mango trees are treated against the pests.

## LOCUST CONTROL.

Locust visitations are not common. In June, 1953 there was a small visitation of locusts but no serious damage was done.

## MISCELLANEOUS.

The Plant Protection staff has also to take steps against the common diseases that affect groundnut, maize, sugarcane, etc. The villagers are slowly turning to the use of insecticide to protect their crops.

## LAC CULTIVATION.

Lac was an important industry in Chatra subdivision before. The most important host trees for lac in Hazaribagh district are *kusum*, *palas*, *bair* and *khair*. With the fluctuation in the demand for the lac the cultivation of the crop has also had its vicissitudes. Lac cultivation is mostly confined to Chafra subdivision.

Demonstrations for improved method of lac cultivation are carried out at the villages.

## HORTICULTURE.

From Horticulture point of view Hazaribagh is poorly developed. The soil being mostly hilly it may not be possible to have successful orcharding in all the areas. But looking at the acreage under different fruit crops it can be said very well that there is a good scope for its development so far as mango, custard apple, jackfruit and papaya are concerned.

Hazaribagh papayas have a considerable fame even outside the State. The Agricultural School at Sitagarha has a fruit production scheme attached to it. The seedlings and grafts raised in the nursery at Sitagarha as well as from Sabour are sold within the district of Hazaribagh. There are some private nurseries and a nursery of Damodar Valley Corporation which have encouraged papaya cultivation.

The acreage under vegetables is fairly good. The district grows potato on a large scale, but the acreage under other fruits is not so satisfactory. There could be development in the acreage for onion, cauliflower and tomato. The produce, so far, is low to meet the demands of the people of the district.

The area in acres for fruit orchards in Hazaribagh district is given below along with the total area in acres in the State of Bihar :—

	Hazaribagh.	State of Bihar.
Mango	200	2,17,517
Litchi	25	23,616
Lime	10	5,960
Guava	10	19,992
Banana	300	20,800
Orange	41	1,048
Custard apple	200	6,400
Jackfruit	200	9,960
Papaya	100	9,700

There is certainly a great scope for more cultivation of fruit trees in this district.

The area in acres for vegetables in Hazaribagh district is given below along with the total area in acres for the State of Bihar :—

	Hazaribagh.	State of Bihar.
Potato	5,200	83,550
Onion	685	23,489
Cauliflower	523	6,749
Tomato	790	5,119
Cabbage	63	534
Carrot	80	1,004
Turnip	160	1,745

Besides these vegetables, more chillies, spinach, beet and other winter vegetables could be grown.

#### ORGANISATION OF AGRICULTURE DEPARTMENT.

Among the Gazetted Officers there is a District Agricultural Officer at the District headquarters, and there are three Grow-More-Food Officers, one at each subdivisional headquarters of Sadar, Chatra and Giridih subdivisions to supervise the work.

Among the non-gazetted staff, there is a District Engineering Supervisor attached to the office of the District Agricultural Officer to supervise the work of the medium and minor irrigation works. Among the other technically qualified staff who supervise the execution of irrigation schemes, are the Engineering Overseers, one in each subdivision of the district. There are also three work *sarkars* in each subdivision for the same purpose.

Besides them there are eleven Agricultural Inspectors, one each posted in the Intensive Cultivation Blocks and the rest are in charge of the subdivision depots of seeds, implements and manures in each subdivision. Under them are nine *kamdars* in each subdivision.

To carry out the field trials of manurial tables scheme, there are two Field Assistants in each subdivision posted in the interior thanas.

#### LIVESTOCK.

The comparative statistics of the livestock population of Hazaribagh district from 1940 to 1951 have been shown in the statement on page 198. The figures show an increase in the livestock population but the performance is very poor. A cow of this district has an average yield of not more than 6 or 7 chataks of milk and bullocks and buffaloes are also of small stature. They are not very suitable for hard ploughing. The bulls are of inferior strain. The Animal Husbandry Department has distributed a number of pedigree bulls in the rural areas of the district. *Goshalas* at Pachamba, Giridih, Hazaribagh and Kodarma have also been given some pedigree bulls. An Artificial Insemination Centre has been opened at Hazaribagh. The Animal Husbandry Department is discouraging the use of inferior bulls for breeding purposes by encouraging a mass castration of bull calves. A small poultry farm has been opened at Bokaro. There are also small poultry farms at Hazaribagh and Sitagarha.

#### VETERINARY AID.

In Hazaribagh district there are 10 Veterinary Institutions out of which there is one District Headquarters Hospital at Hazaribagh

and another in the subdivisional headquarters at Giridih and each of the above hospitals is managed by a Senior Veterinary Assistant Surgeon. There are also Static Veterinary Dispensaries at Hazaribagh, Ramgarh, Kodarma Suraiya, Chatra, Chauparan, Giridih and Dhanwar. There are Field Veterinary Dispensary Centres at Ichak, Jhumra, Chitarpur, Domchanch, Jainagar, Bagodar, Isri Semaria, Unta, Itkhori, Singhrawan, Maliesmunda, Banarkup, Doranda and Mirzaganj. Veterinary aid is available at these hospitals and dispensaries.

The common contagious diseases are Rinder-pest, Haemorrhagic Septicaemia, Foot and Mouth diseases and Anthrax. At the important fairs at Chatra and Lawalong a large number of cattle are sold. At the time of the fairs veterinary aid is made available.

#### IRRIGATION.

In the last District Gazetteer of Hazaribagh the following paragraph from the Settlement Reports was quoted :—

“ Except in Gawan, Satgawan and Hunterganj where the riparian villages are irrigated from the Sakri and Leelajan rivers there is no irrigation in the district except from *ahars* and wells. Irrigation from wells is confined to cultivation with the *bari* lands adjacent to the village site and to sugarcane. Irrigation from *ahars* is confined to the lower rice lands which are classed as *dhan-khet* (1) and (2). The total area of land benefited directly by irrigation is 13,872 acres, which represents only 1.07 per cent of the cultivated area. ”

In comparison to this picture in 1917 there has been a great progress in the provision for irrigational facilities in the district.

During the management of Court of Wards of Ramgarh Estate, i.e., from 1913-14 to 1937-38, a large number of new *ahars* or water reservoirs were excavated along with a number of old ones repaired or re-excavated. Almost all the Khalsa villages were provided with one *ahar* and nearly 5,000 acres of *gairmazara* lands were brought under cultivation. The total expenditure amounted to Rs. 3,74,202 and the entire cost was borne by the Estate.

Since 1935-36 a large number of schemes had been undertaken by the Government for rural water supply. These schemes are not only meant for domestic water supply but also for irrigation purpose. The State took up this work as the landlords neglected maintaining and constructing small irrigation works due to commutation of produce rent into cash and the impending abolition of zamindari.

During the Second World War the schemes for private irrigation remained neglected. But since 1946 when the Congress party resumed office the schemes have again been encouraged. A block grant was made to finance the schemes throughout the province. The provisions of the Bihar Private Irrigation Works Act, 1922 were extended to the district of Hazaribagh by the Bihar Private Irrigation Works Regulation, 1940 (Bihar Regulation I of 1940).

Since 1947-48 minor irrigation works throughout the district were taken up. The programme of minor irrigation drive from April, 1948 consisted of construction and repairs of *bunds*, *ahars*, etc., clearing of *pynes*, water channel, etc., re-excavation of silted *pynes*, tanks and *khantas*, etc.

The schemes completed during the years 1948-49 to 1952-53 are as follows :—

Years.	Schemes taken up.	Schemes completed.	Amount spent in round figures. Rs.
1948-49	497	413	6,19,758
1949-50	551	324	6,90,998
1950-51	857	628	12,49,984
1951-52	706	411	10,40,000
1952-53	308	212	3,78,898

Under Grow-More-Food Campaign the following work was done :—

Scheme.	Number of Schemes.	Cost in round figures. Rs. a p.
(i) Medium irrigation schemes constructed during 1943-44 to 1952-53.	6	1,30,180 0 0
(ii) Minor irrigation schemes constructed from 1950-51 to 1952-53.	606	2,95,574 11 0
(iii) Wells constructed during 1947-48 to 1952-53.	449	2,32,867 15 0
(iv) Rahat pumps installed during 1947-48 to 1952-53.	112	28,575 15 0
(v) Lift Engine and Pumps supplied during 1949-50 to 1952-53.	90	79,978 4 0
(vi) Open boring work done during 1950-51 and 1952-53.	8	728 4 0

## MAJOR IRRIGATION SCHEMES.

The Damodar Valley Corporation has taken up several major schemes. One of the important major schemes constructed under the provisions of the Bihar Public Irrigation and Drainage Works Act, 1947 is Jurga Irrigation Scheme in the district of Hazaribagh. The existing Head Works of the Barki Nadi located near village Jurga which is situated about 13 miles south of Hazaribagh consist of a diversion dam and an irrigational channel taking off at one end. The dam is a very old one. The irrigation channel is rather narrow and the water which can go to the fields is limited by its present discharging capacity which is rather small.

The scheme was taken up in April, 1950 and was completed by June, 1952. A number of villages, namely, Jurga, Arahra, Langatu, Chepa-khurd and Dari Kalan have been benefited by the construction of the dam. The scheme has been constructed at an estimated cost of Rs. 76,827. Some of the other important schemes taken up are Chharwa and Gondo dams. The latter serves to irrigate fields through channels.

## AGRICULTURE MARKETING.

*Hatias and Arhats.*

There are very few organised markets in the district and sales and purchases usually take place in the *hatias* spread over the whole district. These *hatias* are the local markets where the local produce is generally bought and sold.

There are also certain *arhats* in the district where *arhatiyas* or stockists of the urban markets normally make purchases from the adjoining rural markets and build up a stock. Occasionally the *arhatiyas* keep the produce of a big cultivator in their stock and sell the grains charging 3 pies to 6 pies per rupee of the price as their commission.

There is no uniformity in the market charges prevailing over various markets of the district. Market charges prevailing commonly in some important markets of the district are as follows:—

Items of cost.	Payable by seller.	Payable by buyer.
1. Arhat (Commission) ..	12 annas 6 pies per Rs. 100.	12 annas 6 pies per Rs. 100.
2. Dharmada ..	6 pies to 1 anna per Rs. 100.	6 pies to 1 anna per Rs. 100.

Items of cost.	Payable by seller.	Payable by buyer.
3. Gausala ..	6 pies to 1 anna per Rs. 100.	6 pies to 1 anna per Rs. 100.
4. Pathsala (in some cases only).	1 anna per Rs. 100	1 anna per Rs. 100.
5. Handling ..	..	1 anna to 3 annas per bag of 2½ to 2¾ maunds.
6. Packing ..	..	6 pies per bag.
7. Cartage for full cartload	12 annas to 14 annas per mile.	12 annas to 14 annas per mile.
8. Interest per month (in the case of money advanced to seller or credit sale).	12 annas per cent	12 annas per cent.

## MARKETS.

Within the district of Hazaribagh, Hazaribagh Chatra, Giridih, Kodarma (Jhumri Telaiya) and Ramgarh are the main markets. The markets of lesser importance are Gola, Peterbar, Isri, Hazaribagh Road, Bagodar and Chauparan.

*Hazaribagh Market.*

This market is also important for dealing in vegetables, fruits, etc., in addition to foodgrains. About 200 maunds of vegetables are brought for local sale or export every day. This market exports a large quantity of potato to Patna and Gaya due to a local early crop. Later potato is imported from Patna and Bihar. Potatoes, green vegetables like green chillies, peas, beans and tomatoes are exported to the mining areas. About 100 maunds of vegetables are sent to the mining areas every day.

So far as fruit is concerned, it is mostly imported from Patna and Gaya excepting in the case of forest fruits. There is one fruit *arhat* at Hazaribagh which imports 25 per cent fruits from Gaya and 75 per cent from Patna. Retail dealers purchase fruits for retail sales from this *arhat*.

So far cereals are concerned, it is difficult to get locally produced rice in the market after May. After May the rice available in this market is mostly rice imported from Gaya, Madhya Pradesh and Madras. The volume of wheat transacted at Hazaribagh market may be estimated at 15,000 to 20,000 maunds per month of which the supply of the State is responsible for about 35 per cent. Uttar Pradesh and Punjab supply 30 per cent and 25 per cent respectively and

the rest is supplied by Madhya Pradesh and other areas. Hazaribagh market has larger transaction of wheat flour (*atta*) than wheat. Local supply of wheat hardly exceeds two thousand maunds per month.

Among pulses, *masur* and *khesari* are imported from Bihar side and *arhar* and gram are imported from the different markets of the Uttar Pradesh.

Commodities like chillies and turmeric are imported from Patna and Calcutta respectively. Black pepper and other spices are imported from Calcutta. The bulk of the total volume of mustard oil, about 90 per cent, is imported from Uttar Pradesh.

#### *Kodarma (Jhumri Telaiya) Market.*

Kodarma mining area is very deficient in respect of foodgrains and other necessities of life. Consequently rice and paddy are imported from Chakradharpur in Singhbhum district. Pulses are imported from Uttar Pradesh and the other States of the Indian Union.

Kodarma railway station has a large outward goods traffic. But the major portion of this traffic relates to mica and mica wastage. Some quantity of bamboo is also sent to other markets.

The total inward traffic for four months at Kodarma railway station goods-shed are given below :—

January, 1955—	62,012 maunds.
February, 1955—	63,711 maunds.
March, 1955—	1,09,637 maunds.
April, 1955—	88,474 maunds.

About 50 per cent of the inward traffic relate to foodgrains and within the 50 per cent come salt, manure and mineral oils. However, this constitute only 50 per cent of the foodgrains imported in this market from outside. The other 50 per cent is imported by trucks. So calculated this market alone roughly imports about 9 lakh maunds of foodgrains per annum. These imported foodgrains are not re-exported to any other big markets in the district. The stock finds its way to the smaller rural markets.

During the jackfruit season, every week about 150 bags of  $1\frac{1}{2}$  maund each of jackfruit are exported from this station to upward direction beyond Moghalsarai for about two months. So far other kinds of fruits and vegetables are concerned, they are imported here from Patna, Gaya and Chandannagar. Besides, some vegetables are also imported by bus and truck from Gaya.

On the two *hat* days of the market sheep, goats and cows are also brought for sale in large numbers. The animals are of local breed only.

#### *Giridih Market.*

Giridih is mainly important for mica. Next to mica, this market is also important for exporting forest fruits like *aurah*, *bahara* and *harrah* (myrobalan). About 300 maunds of myrobalan are exported from here to other markets. About 75 per cent of the total export goes to Calcutta. Previously about 500 to 600 maunds of these fruits were exported but due to the gradual cutting down of timber the export has decreased.

Livestock products are also exported from this market. Approximately 500 to 600 maunds of hides per month are despatched from Giridih to Calcutta.

So far foodgrains are concerned, Giridih exports a very small quantity of paddy to Bengal. Other commodities, namely, sugar, gram, wheat and pulses are generally imported from outside markets. About 24,000 to 30,000 maunds of pulses are imported every year from Uttar Pradesh and about 25,000 to 30,000 maunds of cereals from the different markets of this State. Foodgrains are not imported here for the purpose of re-exporting but for the purpose of disposal in the same locality.

Potatoes and dry onions to the tune of about 25,000 to 30,000 maunds annually are imported here from Patna by trucks for final disposal. Besides, a large quantity of dry onion is also imported here from Nasik. Potatoes from Itawa (Uttar Pradesh) are also imported here.

So far as green vegetables are concerned besides local supplies a large quantity is brought from Hazaribagh and its adjoining villages. On the weekly *hat* day buffaloes, cows, goats and chickens are brought for sale.

Fairs are also important centres for agriculture marketing. Fairs have been mentioned under the chapter "Directory".

## HAZARIBAGH.

Statement showing livestock population of Hazaribagh district as compared with the livestock population of Bihar.

Year.	Total cattle.		Male cattle.		Female cattle.		Young stock (calves).		Total buffaloes.		Male buffaloes.		Cow buffaloes.		Young stock (buffalo calves).	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1920	...	{ Bihar Hazaribagh	13,420,888	5,264,428	4,822,702	8,599,648	9,179,057	749,905	1,440,097	995,025	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	787,043	260,403	273,908	217,282	213,702	107,901	53,846	51,355	...	...	...	...	...	...
1925	...	{ Bihar Hazaribagh	43,935,087	6,409,883	4,642,114	6,326,740	8,307,785	765,052	1,475,713	977,030	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	694,079	275,631	263,274	154,203	170,179	100,777	44,470	24,026	...	...	...	...	...	...
1930	...	{ Bihar Hazaribagh	14,293,434	4,907,360	4,707,460	3,684,365	3,513,881	806,487	1,561,473	1,065,771	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	729,374	289,792	253,548	180,030	170,947	123,083	82,105	24,697	...	...	...	...	...	...
1940	...	{ Bihar Hazaribagh	12,564,269	5,286,595	3,749,852	3,427,812	2,591,708	544,435	1,370,044	977,229	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	708,573	292,243	224,680	101,360	152,413	80,348	31,870	31,886	...	...	...	...	...	...
1945	...	{ Bihar Hazaribagh	11,289,406	6,129,342	3,895,948	2,797,756	2,862,727	677,497	1,279,910	905,380	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	640,387	283,004	205,259	159,124	161,196	97,160	37,952	20,634	...	...	...	...	...	...
1951	...	{ Bihar Hazaribagh	15,297,476	6,532,019	6,032,291	3,723,166	3,315,875	778,316	1,599,977	937,582	...	...	...	...	...	...
	...	{ Bihar Hazaribagh	880,390	390,870	312,543	209,017	193,925	125,065	47,452	21,468	...	...	...	...	...	...

## SOIL CONSERVATION AND ALLIED ACTIVITIES OF DAMODAR VALLEY CORPORATION.

The efforts of Damodar Valley Corporation that have their soil conservation and allied activities throughout the district of Hazaribagh are still in an experimental stage. They have taken up a very important problem that affects the agriculture economics of the district and they have already achieved some concrete results. A brief summary of their work is given below.

The programme of the Soil Conservation Department of the Damodar Valley Corporation includes survey and assessment of erosion and planning and execution of erosion prevention measures in the Valley. Survey has been standardised after consultation with leading soil scientists in India. Soil samples are examined in the laboratory at Hazaribagh. Land Use Planning is done for selected areas for re-settlement on the basis of soil capability maps.

A number of stations have been set up by the Corporation in addition to some stations established by the State Government. Various kinds of experiments, to find out suitable soil conservation practices; such as, contour cultivation, contour strip cropping, etc., in getting maximum output of food crops and fodder without deterioration in the soil, are being conducted in the Deochanda Experiment Station.

In an integrated planning including the conservation of soil and water survey of natural resources, collection of basic data is essential pre-requisites. The only maps available for the area were the 16" to the mile cadastral maps from the Revenue Department which were drawn up during the last Settlement about 30—40 years ago and indicate areas cultivated and uncultivated, forests, etc., at that time and the topographical maps of the Survey of India on the scale 1",  $\frac{1}{2}$ " and  $\frac{1}{4}$ " to the mile and contours of 50' to 250'. The present distribution of agriculture and forests has considerably changed and more detailed topography in any planning of soil conservation and use of land was essential. So steps were taken to prepare air maps on 6" to the mile sketch with 10' contours with full topographical features of the type necessary.

*Soils and Crops.*

Detailed survey has been made to make an inventory of the soil resources identifying and classifying the soils into numerous categories on the basis of the inherent physical and chemical study of natural

features such as slopes, drainage, structure and texture, extent of erosion, the degree of plant nutrition available and its depletion, current productive capacity as well as its potential capacity and other characteristics.

Pre-irrigation soil survey of about 7,000 acres has been completed with the object of classifying soil on the basis of profile studies to assess the water requirements, in short to be able to get maximum benefit of irrigation water.

Systematic soil survey of about 34,000 acres has been done. The objective of the survey is to establish the various factors of soil formation and their " series and types ". This study is conducted along with erosion and present land use survey.

After studying the soil maps produced on the basis of soil survey data recommendations are made for the proper use of land. Land use planning for an area of 29,901 acres has been completed.

The knowledge gathered in field terracing, gully plugging, fodder production and afforestation is being spread among the villagers from Demonstration Centres so that they can make their lands more productive.

*Agronomy and Agrostology.*

Research work under this section is conducted in the Research Station established at Deochanda, about 22 miles from Hazaribagh to find out suitable soil conservation practices.

Thirty-nine run-off plots at 3 per cent and 5 per cent slopes for measurements of the run-off of water and silt against the rainfall of each storm under different types of grasses and vegetation at different fertility levels and under different cultivation practices have been constructed. Lysimeter experiments have been set up to measure the amount of nutrients washing down and the amount used up by plants. Two small automatic run-off recording stations have also been set up. Different types of local and imported grasses, shrubs and trees known for providing good cover and comparatively inedible to goats and cows are being tried out at this Experiment Station. The giant star is a very successful find and is now being used for turving the downstream surface of the earth-dams.

*Land Improvement.*

This includes mechanical reclamation of lands and follow-up operation by means of green manuring and proper application of fertilizers. Activities of this section also include utilisation of

seasonally submerged lands for agriculture by using receding water of the bigger reservoirs for irrigation. The total area of the reclamation up to date is 6,497 acres of which 4,500 acres have been reclaimed in Telaiya reservoir and the remaining in Maithon and Konar areas. The follow-up treatment on 5,400 acres has been done. Newly reclaimed fields have to be saved from the inroads of rains. The improvement of such fields consists in the provision of spillways and their maintenance, protection and maintenance of fields, bunds and channels. Experiment-cum-demonstration farm for the utilisation of the seasonally submerged land of Telaiya reservoir has been undertaken on an area of 25 acres. Two more such farms are being established in the area.

#### *Agricultural Chemistry.*

A laboratory has been established at Hazaribagh to analyse samples of soils, rocks, fertilizers, manures, plant and water in connection with agricultural experiments, survey of soils, waste land reclamation and afforestation.

#### *Headwaters Engineering Circle.*

The following are the functions of the Circle which are connected with general well-being in the Valley and include the projects carried out for the State Government on an agency basis:—

- (i) Erosion control including silt studies of the upper catchment, contour survey and planning, rainfall and discharge measurements in the watershed, flood routing calculations, etc.
- (ii) Studies of technique of banding, terracing and trenching both in regard to design and execution.
- (iii) Technique of gully control, check-dams, etc.
- (iv) Investigation and design for pondage, diversion banks and waterways.
- (v) Planning of dams and minor irrigation works including irrigation channels, in relation to headwaters control.
- (vi) Hydrological studies in the catchment areas under different conditions of management.

This Circle has completed preliminary investigation of 30 dam sites either for irrigation and/or headwaters control. Detailed designs for six dams have been completed of which two have been executed and completed with irrigation systems and two are in progress. Five small dams for minor irrigation in rehabilitation areas have also been executed.